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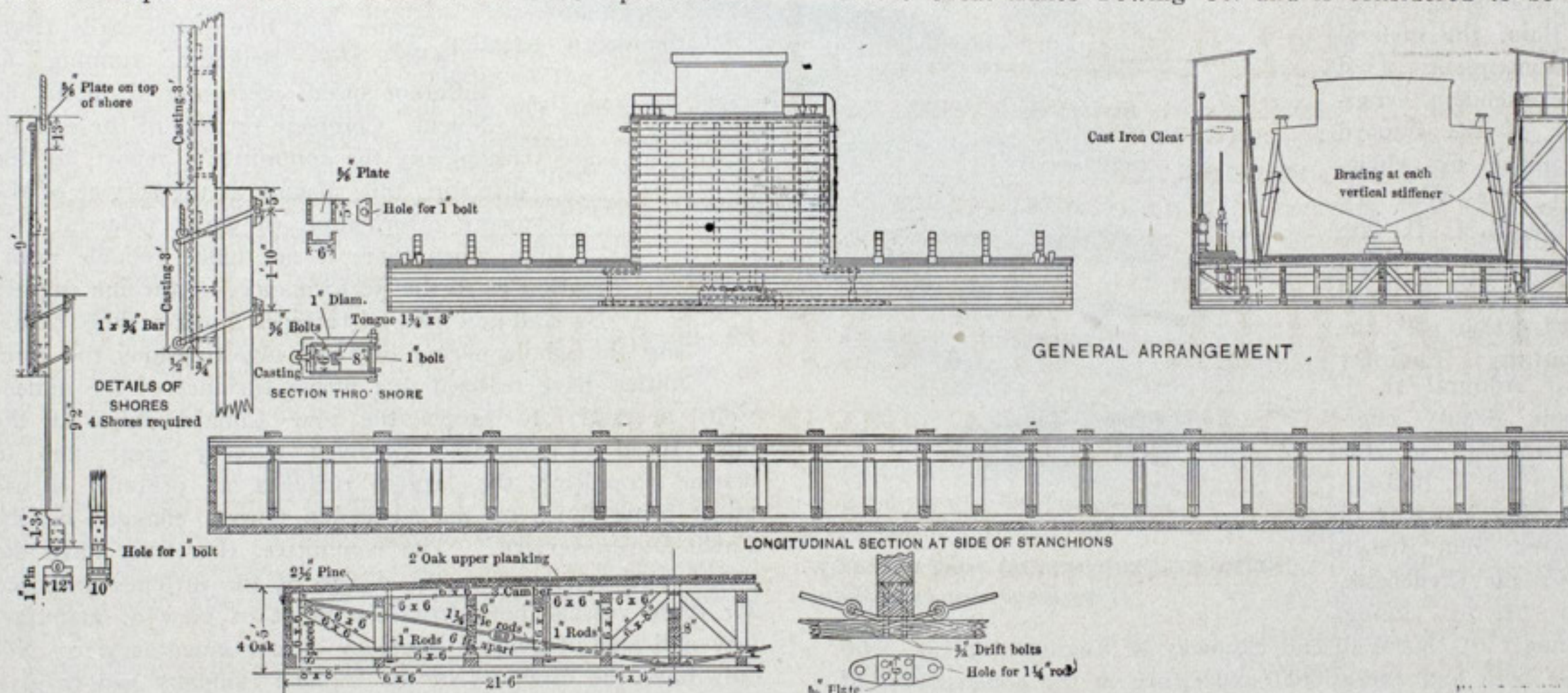
CLEVELAND, O., APRIL 7, 1904.

No. 14.

TOWING COMPANY'S FLOATING DRY DOCK.

The floating dry dock which the American Ship Building Co. of Cleveland is building for the Great Lakes Towing Co. possesses some unusual features. It is intended to be located at Fairport, where the towing company has a well-equipped machine shop and where it intends to make all repairs to its

is connected with the pump. There are also two sea cocks or flooding valves connected with the manifold. By the proper operation of the valves the suction pipes are used to flood the various compartments in order to submerge the dock. The dry dock is intended exclusively for the docking of the tugs of the Great Lakes Towing Co. and is considered to be an



FLOATING DRY DOCK FOR GREAT LAKES TOWING CO.

tugs in the future. The company may also eventually build tugs at Fairport, but that is something for the future to determine. The floating dock is 76 ft. long, 43 ft. beam and 5 ft. deep on the side. The deck is crowned to the extent of 3 in. for the purpose of shedding water. Instead of the side of the deck being extended for the full length as is customary in this type of floating dry dock, there are two towers placed amidships, one on each side, so that in reality she is simply a deck scow with the addition of the towers mentioned. The purpose of the towers is to form a resting place for the heels of the midship's side shores, so that the tug can be steadied on the blocks as she is being floated. They also form a working platform where the valves and other gear can be manipulated from. The dock will be fitted with 10-in. submerged centrifugal pumps built by the Morris Machine Co. of Baldwinsville, N. Y. The hull will be subdivided into twelve water-tight compartments, each one of which is fitted with its own suction pipe leading to a manifold, which in turn

efficient type for this purpose, as well as being economical both in operation and construction.

The committee on merchant marine and fisheries of the house of representatives has reported favorably upon the bill to extend the coastwise laws of the United States to the Philippine trade to become operative July 1, 1905. The committee in its report says that it believes that by the time the law goes into effect, sufficient American vessels will be available to handle all the trade between the United States and the Philippine islands. Representative Stevens of the same committee filed a report requiring all supplies of the United States transported by sea to be carried either in ships belonging to the United States or flying the American flag. The report cites that in the necessities of war it is most vital that the government should have its supplies and troops carried in vessels of its own or under its control.

TURBINES FOR CUNARD FLYERS.

They Have Been Definitely Decided upon by the Commission for the New Leviathans—Steamship Travel to the World's Fair.

Liverpool, March 28.—I have just received from the Cunard company here the following official statement, which shows that turbine engines have been definitely decided upon for the two new leviathan Cunarders. The committee appointed last September by the Cunard company to consider the advisability of adopting turbine engines in the new fast steamers which the company are to build under their agreement with the British government, have concluded their labors, and their report, which is, of course, confidential, has been presented to the directors of the Cunard company. The directors, after full consideration of the report, have decided to adopt turbine engines in these steamers. As will be seen from the list of the members, the committee was an exceptionally strong and representative one, consisting of Mr. J. Bain, the general superintendent and superintendent engineer of the Cunard Steamship Co., chairman; Sir Wm. H. White, K. C. B., late assistant controller and director of naval construction at the admiralty; Engineer Rear Admiral H. J. Oram, deputy engineer-in-chief of the navy; Mr. T. Bell, engineering manager of Messrs. John Brown & Co. at Clydebank, and Mr. A. Laing,

manager of the Wallsend Shipway & Engineering Co., who have both had exceptional experience in the construction of the largest marine engines; Mr. H. W. Brock, partner in Messrs. Denny & Co., of Dumbarton, which firm has had the largest amount of experience with turbines applied for marine propulsion; Mr. J. T. Milton, chief engineer surveyor of Lloyds register of shipping; with Engineer Lieutenant W. H. Wood, R. N., as secretary, who has for the last three years been secretary to the admiralty boiler committee. At the time of the formation of the committee a small amount only of information was available as to the relative economy of turbine engines and reciprocating doing similar duty and developing similar power; the work of the committee has been therefore largely experimental. Two series of comparative tests have been carried out under their direction, one on shore at the Neptune Bank station of the Newcastle-on-Tyne Supply Co. and the other afloat with the steamships Arundel and Brighton of the Newhaven-Dieppe route. Both ashore and afloat the relative economy of the different types of engines was determined by the steam consumption per unit of power, and to obtain this tanks were fitted by means of which the condensed steam from the en-

gines was accurately measured. At Neptune Bank the tests were made with reciprocating engines and turbine engines running at various proportions of full power and full speed, the output of electricity being recorded in each case. The speed of turbine engines fitted on shore is considerably higher than is permissible for those for marine purposes, when the speed of rotation is limited by considerations of propeller efficiency. In view of this, although the experiments at Neptune Bank were of great value, those carried out with the steamships were still more useful. The results obtained with the two steamships were exactly comparable, as the Arundel

and Brighton are practically sister vessels, the only difference being in the machinery, the Brighton having turbine engines and the Arundel reciprocating engines. The two vessels were first run side by side from Newhaven to Dieppe and back (one of them being on the ordinary service), thus eliminating the possibility of errors by variations of

weather and tide; afterwards trials with the Brighton running at different speeds were carried out in the Solent. Complete records of these trials accompany the committee's report to the directors, thus placing at the service of the company information of great value at this time, when there is not much reliable information as to the performances of turbine engines on land and little of turbines fitted in ships.

During the whole period of their investigations the committee have realized that fitting turbines of the dimensions necessary to propel the new Cunard ships at the high speed contemplated involved a very great step in marine propulsion, the largest turbines at present in use afloat being those on the steamship Queen, engaged on the Calais-Dover service. The committee, therefore, have devoted much attention to the design of the turbines proposed for these vessels, both from the point of view of manufacture and also of general efficiency on continued service. Not only have the directors of the Cunard company had to give much consideration to the question of the adoption of turbines as against reciprocating engines, but the design and the dimensions of the new ships have also required much careful thought and attention. In this the directors have not only had the assistance of their own staff, but also of the best outside expert advice that it was possible to obtain. Most exhaustive and careful experiments have been made in regard to the best form for the ships, and every point in connection with their size and design in every detail have been gone over many times and carefully thought out and calculated. All this has required much time, as many models and designs have been prepared, but it has not been time wasted, and the Cunard company aided by experts have endeavored to arrive at what is not only the best but the most suitable ship for the requirements of the trade, and one which will fulfil the conditions of the agreement with the government. The directors hope shortly to be in a position to announce that the design and the dimensions of the steamers have been agreed upon and that contracts have been placed for the building of the vessels.



UNITED STATES TORPEDO BOAT WINSLOW.
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I have given this official statement in full to show how thorough and exhaustive the inquiry has been which has justified the Cunard directors in finally deciding upon turbine engines. The finding of the committee has been described as a distinct triumph for the turbine, and will go far towards firmly establishing this type of engine as the new mode of propulsion for high speed vessels. But before the new Cunarders are built there will be many opportunities of seeing what the turbine engines are capable of doing in the third-class cruiser *Amethyst*, and in the two new Allan liners now being built. The *Amethyst* is said to be now ready for an exhaustive series of trials which will be watched with the greatest interest by naval and engineering experts.

In this connection Messrs. John Brown, Ltd., Clydebank, has within the last few days launched for the Midland Railway Co. the twin-screw steamer *Antrim*. She is the first of four sister ships building for the company's tourist traffic, a duplicate being under construction at Greenock, and turbine propelled steamers at Dumbarton and Barrow. They are to be of high speed.

Mr. John Wilson of Mississippi, a well known American cotton planter, left Liverpool on Thursday with a number of negroes for West Africa to start cotton growing. They are proceeding to Sierra Leone, and are hopeful of securing an allotment of land from the governor. Mr. Wilson has great hopes of cotton growing in Africa, and states that he is in a position to take over from America hundreds of negroes to take up the cultivation of cotton.

The people who visit the forthcoming St. Louis exhibition will have prominently brought before their notice, by means of numerous models, the immense progress which has been made in regard to the building of the Cunard fleet. The collection of little craft will number about a dozen, commencing with the paddle steamer *Britannia*, which, built in 1840, was the earliest Cunarder. Then there will be represented the various liners which have followed, thereby indicating the changes which have been made in so many different ways and culminating in the magnificent liners of the present day. The forthcoming developments in connection with the Cunard fleet will also be foreshadowed, for the models will embrace two of very great interest, one of the *Caronia*, which is at present building, and is to be 21,000 tons gross and 680 ft. in length, whilst the other will represent the two fast liners which are to be built under the agreement with the government. This, at least, indicates the progress which has been made in regard to the construction of these steamers, and the model, which it is understood will be a very fine one, will undoubtedly attract widespread interest.

Many changes have been made in the captaincy of Cunard vessels in consequence of the advent of the new liners *Slavonia* and *Pannonia*, which with the *Aurania* are to maintain the company's new service between Austria-Hungarian ports and New York. The *Slavonia* is now on her way to the Adriatic to inaugurate the service. Capt. Barr, late of the *Carpathia*, has been transferred to the new *Slavonia*; Capt. Potter, late of the *Aurania*, will take over the *Pannonia* when she is ready; Capt. Dow has been transferred from the *Ultonia* to the *Aurania*; Capt. Jeffries to the *Ivernia*; Capt. Turner to the *Carpathia*, and Capt. Thompson to the *Ultonia*.

It is many years since the shipping companies had such good reason as they have at present to look forward to an exceptionally heavy passenger traffic from this country to the United States, the high class passenger business usually depending on Americans coming over here on their annual visit to England and the continent. This year, however, it is anticipated that the numbers from both sides will be larger than ever, and the prospects for shipping interests are therefore exceptionally bright. For one thing intending

visitors to the St. Louis exhibition are, according to inquiries made, likely to be very numerous, whilst late in the season a large number of members of the Iron & Steel Institute are going over in response to an invitation from Mr. Andrew Carnegie. The bulk of the members will cross by the White Star line and the same line's steamers will also carry the president and members of the Institute of Mechanical Engineers and the Institute of Electrical Engineers, who are also visiting the states.

Judgment has been given this week in admiralty court in the salvage suits against the Canadian Pacific Railway Co.'s steamship *Lake Michigan* for services rendered after the collision with the bark *Matterhorn* on Feb. 19, when the *Lake Michigan* was beached in Dungeness bay in a sinking condition. Mr Justice Barnes in giving judgment said the principal service consisted of beaching the *Lake Michigan*, which was performed by the tug *Oceana*. Had the *Lake Michigan* not been beached there was no doubt that she would have sunk. She was subsequently patched up and floated and towed by the *Dauntless* and other tugs into the Thames. The court awarded the *Oceana* £2,000, the *Dauntless* £325, the lifeboatmen £300, and the pilot £225.

RICHELIEU & ONTARIO CO. APPOINTMENTS.

At a meeting of the board of directors of the Richelieu & Ontario Navigation Co., held on Monday, March 28, the following appointments were confirmed:

Steamer.	Line.	Captain.	Chief Engineer.
Kingston	Montr'l - T'ronto.	H. Esford.	A. R. Milne.
Toronto	"	E. A. Booth, Jr.	W. A. Black.
Bohemian	"	A. Dunlop.	G. Gendron.
Columbian	"	G. Batten.	Jas. Conlin.
Spartan	Hamilton	J. McGrath.	R. G. Marshall.
Corsican	"	D. Mills.	W. S. Parker.
Hamilton	"	J. Stevenson.	A. Demartigny.
Algerian	"	Jos. Foubert.	C. Gendron.
Quebec	Montr'l - Queb'c.	L. O. Boucher.	F. Gendron.
Canada	"	L. St. Louis.	Jos. Hamelin.
Carolina	Saguenay	A. Fortin.	N. Beaudoin.
Virginia	"	J. Dougal.	M. Latullipe.
Saguenay	"	C. Lapierre.	G. Gagnon.
Three Riv'rs	Three Rivers.	C. Gouin.	J. Matte.
Berthier	"	J. Jean.	E. Dennis.
Beaupre	Pilgrimage	J. B. Mongeau.	E. Arcand.
Chambly	Chambly	G. Paulets.	E. Gendron.
Terrebonne	Contrecoeur	F. X. Laviollette.	E. Beaucage.
Longueuil	Ferry	H. Mandeville.	N. Noel.
Boucherv'e	"	J. Brossard	B. Pintal.
Laprairie	"	G. Marion.	J. Hamel.
Cultivateur	"		F. X. Lacroix.

The Montreal harbor commission has gone so far as to form its specifications for the permanent sheds on the wharves at Montreal with accompanied railway tracks, which have been talked of for two years or more. There will be fourteen sheds in all and they will be built in three groups. The first group consists of four sheds to be built simultaneously. Work on the second group of five sheds will begin in October next and on the third group, also of five sheds, will begin in October of 1905. Tenders for the whole are to be opened in May.

H. S. Wilkinson of Syracuse, who is interested with Mr. L. C. Smith, also of Syracuse, in lake vessel property, has announced that he and his associates have purchased a new 8,000-ton steamer now being operated on the Atlantic coast and will run her between Puget Sound, Hawaii and the Orient. The new steamer is similar in size to those operated by the American-Hawaiian Steamship Co., but its name has not been announced.

SHIPPING NOTES FROM SCOTLAND.

Glasgow, March 24, 1904.—The season's trade between the Clyde and American ports is not very promising. Outward cargoes by Anchor and Allan liners are fair, but import cargoes are small and fewer steamers would be in the trade but for the passenger connection and the hope that business may soon improve. The New Orleans trade carried on by a joint service of direct liners and MacLay & Macintyre's steamers seemed in a good way at the beginning of the year, but has now gone back. In the Donaldson line's Newport News and Baltimore trade a reduced service is now on, but the vessels of the fleet are all large. Little improvement is likely before the end of May.

The Fairfield Ship Building & Engineering Co. have a large amount of admiralty work on hand. The Commonwealth is well advanced in her fitting out, and is expected to go on steam trials in April, coming back to the yard to have her armament put on board. The second-class cruiser Highflyer will have her renovations completed in time for the summer maneuvers, and the first-class cruiser Argonaut, recently arrived for overhaul, goes into dry dock this week.

The new Duke of Edinburgh cruiser Cochrane is just getting into shape on the stocks; the scout Forward is plated up; and her sister ship Foresight is getting into frame.

There is material interest for American ship owners in the merchant shipping bill, which has been introduced in the house of commons by Mr. W. Runciman, M. P. The main object of this bill is to effect the change in the law indicated by the recommendation of the select committee on shipping subsidies to the effect that the "Board of Trade regulations should be enforced against foreign ships equally with British ships." Clauses 1 to 16 and clause 18 are designed to bring foreign passenger and emigrant ships trading to and from the United Kingdom within the provisions of the British merchant shipping act, and the regulations thereunder, which relate to passenger and emigrant ships, and to secure compliance with these provisions and regulations. Clauses 20 to 26 are designed to bring foreign ships trading to and from the United Kingdom within the provisions of the mer-

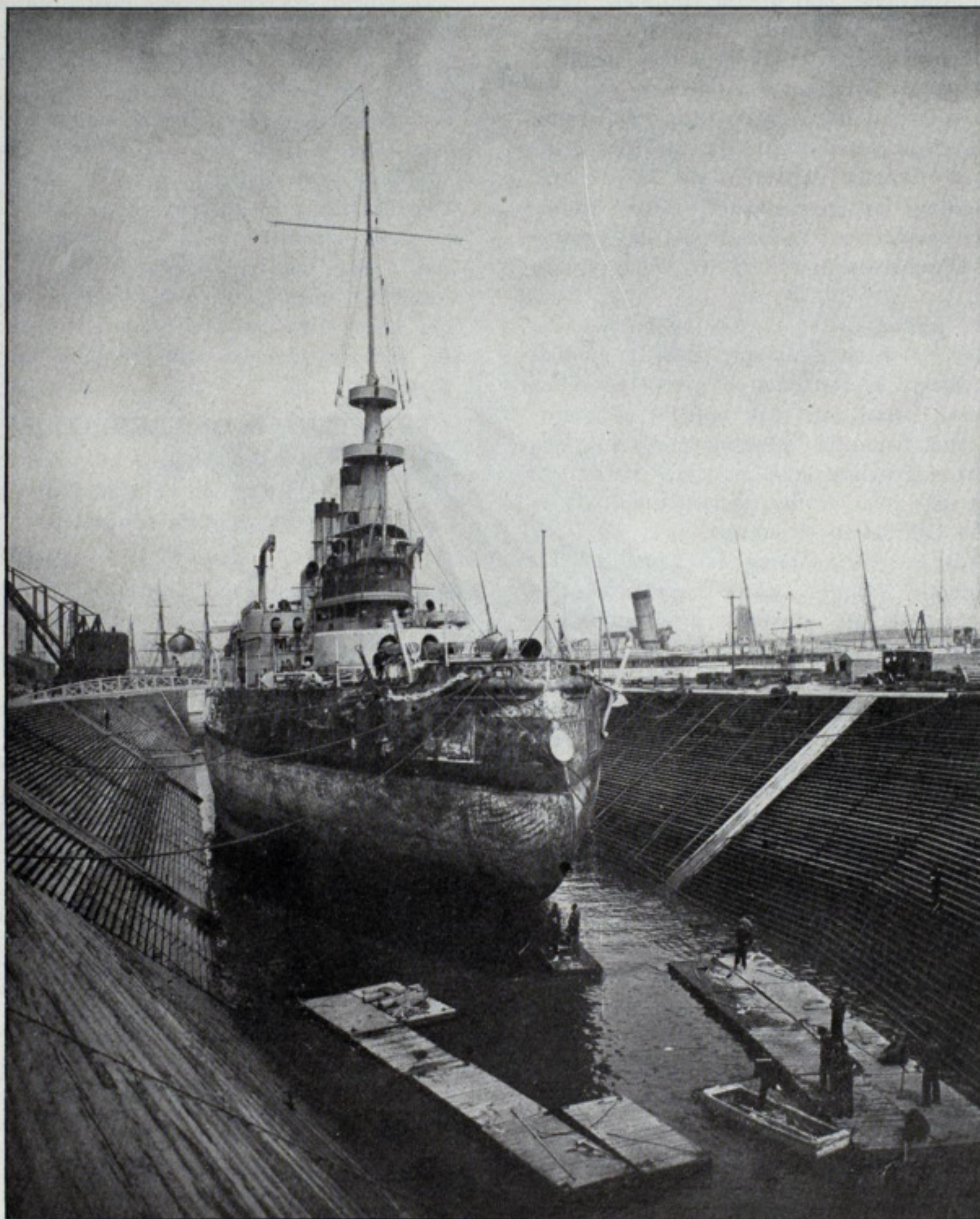
chant shipping act and the regulations thereunder, which relate to safety, including the provisions and regulations as to life-saving appliances, overloading, carriage of grain, and unseaworthy ships. Several of the provisions of the merchant shipping act in regard to passengers and emigrant ships, having been in force since 1854, are no longer adapted to existing conditions, and while extending their operations to foreign ships, the bill seeks to bring such provisions up to date and to provide means by which they can from time to time be so

modified by the board of trade as to meet the varying conditions and requirement of the merchant service. In order that the board of trade may in these matters be assisted by the experience of those engaged in the trade of the country, the bill further provides for the appointment of consultative committees to advise the board in connection with rules and regulations relating to passenger and emigrant ships and the safety of ships.

The new Nelson line steamer Highland Watch is to sail at the end of this month from Glasgow to Monte Video, Buenos Ayres, and Rosario, although Nelson liners do not sail regularly from Glasgow. It is the practice of the owners, however, to despatch their new Clyde-built vessels from Glasgow on their maiden

voyages, and it is probable that the practice may develop into a regular connection with Glasgow, in which case the Nelsons would only be following the example set by many other southern ship owners.

Palmer's Ship Building Co., Tyne, have launched the third-class cruiser Sapphire, built for the British government. The Sapphire is the 776th vessel that Palmer's company have launched. She is the sixty-eighth war vessel they have built in fifty years, an average of one vessel in every ten months. They have built nine battleships, ten cruisers and twenty-one torpedo boat destroyers, besides other craft. The Sapphire is a third-class cruiser of the latest type, specially designed to obtain a high rate of speed on a moderate horse power. Her dimensions are 360 ft. by 40 ft. by 21 ft., the displacement being 3,000 tons on a draught of 14½ ft. She is fitted fore and aft with a protective deck 2 in. thick, under which the boilers, engines and steering gear are placed. In a capacious poop accommodation is fitted for the captain and



UNITED STATES BATTLESHIP MASSACHUSETTS IN DRY DOCK AT NEW YORK NAVY YARD.

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officers of the ship, together with ward-room. The crew are berthed in the forecastle and in the 'tween decks, both of which are large and well ventilated. The magazines are placed underneath the protective deck, and consequently below the waterline. The armament of the vessel includes twelve 4-in. guns, ten of which are placed on the upper deck. The foremost pair and the aftermost pair are capable of fore and aft fire. On the forecastle and on the poop are the usual bow and stern chasers. There are eight three-pounders, four of which are placed on the upper deck amidships, and two are in the forecastle and in the stern, to be used as bow and stern chasers. The two above-water torpedo tubes are fitted on the upper deck. On the forecastle deck there is an armored conning tower of nickel steel, 3 in. thick, from which the maneuvering of the ship is controlled. There are also the usual navigating bridge and searchlight platforms. The vessel has three funnels and two schooner rigged masts, fitted with semaphore signaling and spar for wireless telegraphy. She will be fitted with twin-screw engines, each having four cylinders capable of developing 9,800 H. P. and there will be ten boilers of the Reed water-tube type. The sister vessels to the Sapphire now under construction are the Amethyst at Elswick (for turbine machinery) and the Topaz and Diamond at Birkenhead.

The old White Star steamer Germanic will be in the Montreal trade this season under her new name of Labrador. At present she is undergoing a thorough overhaul and her first sailing will be on May 12th. She is to be a second and third-class vessel.

A new steamship line from New Orleans is projected. Gardiner & Easton, merchants at Cape Town, who have large contracts with the British government for the supply of meat and provisions, are negotiating for a regular service between New Orleans and the Cape for a period of two years.

The St. Lawrence season will evidently be late in opening this year owing to the continued winter weather and the liners have made alterations in their opening sailings. The Dominion and Allan liners are announced to sail on April 21, whilst the Canadian Pacific Railway Co. will send their first Montreal steamer on the 19th. A heavy passenger traffic is being prepared for.

No effort is being spared on this side to get rid of the obstruction against the importation of Canadian cattle. In connection with the movement by all interested to obtain an amendment of the diseases of animals acts so as to admit of the importation of cattle from Canada into this country without the animals being subject to slaughter at the port of landing, it has been decided to have the question raised in the house of commons on a special resolution. Glasgow men have been entrusted with the duty of getting members of parliament to ballot for an evening sitting when the resolution can be discussed, or endeavor to get a private bill for the amendment of the diseases of animals act of 1896 introduced into the house of commons.

A Norwegian steamer, Ragnild, now at Glasgow, from Gothenburg with general cargo, has on her deck a curious form of "life-saving globe." This globe is about 8 ft. in height, very strongly constructed, has two port holes big enough to allow men to enter, and always contains a large supply of provisions. It is so ballasted that it will keep upright in any weather. The idea is that if the ship by any accident is about to sink, the men will get inside the globe, shut the ports, hoist a flag of distress, and then patiently wait to be picked up.

The steamship Minnesota, building at New London for the Great Northern Steamship Co., is nearing completion. The engines are nearly set up. Workmen are now placing the shafts in the sister ship Dakota.

DOMINION MARINE ASSOCIATION.

The annual meeting of the Dominion Marine Association was held at Ottawa, Ont., March 29, C. F. Gildersleeve, president, in the chair. The report of the executive committee, which was read by Francis King, M. A., Kingston, Ont., the secretary, set forth that the association had been established on a firm basis, the membership numbering fifty-one companies or individuals owning 100,000 tons of steam and barge tonnage. During the year past, through the representations of the association, the tolls on the canals had been removed for a period of two years, and if the beneficial results to the trade of Canada, which were apparent during 1903, were continued in 1904, there was little doubt that the order would be made permanent; the tonnage dues and inspection fees had been abolished; there was a small matter in connection with this that still required adjustment, but it was in course of settlement. The charges for the payment of the custom house officers for overtime on Sundays, holidays, etc., had been assumed by the government, thus relieving the shipping companies of a burdensome charge. A satisfactory arrangement was in process of being carried out by which the rules of the road adopted by the Canadian government for the navigable waters west of Montreal would be brought into harmony with those in the United States. Reference was also made to the death of E. W. Rathbun, vice president.

The report was adopted and resolutions were passed expressing the views of the association in favor of the permanent abolition of the canal tolls, and not their suspension for any period; favoring the abolition by parliamentary enactment of the tonnage dues and inspection fees, instead of the government having power to reimpose them at discretion.

There was a lengthened discussion in reference to the proposal to ask the government to enlarge the Welland canal, and it was finally resolved that the association ask for the deepening of the canal to 20 ft. By doing this it was claimed that the interests of the Canadian waterways would be fully protected, and a big stimulus given to the ship building industry of Canada.

Another question considered was that affecting aids to navigation, and the view was expressed that the inland waterways were not sufficiently well provided with lights, buoys, etc., and the association decided that this matter should be brought to the attention of the department of marine. In this connection it was decided to ask the department to arrange that the inland marine should be represented on the recently established lighthouse board, when matters affecting the inland waterways were under consideration.

The following were elected officers, etc., for the current year: President, C. F. Gildersleeve, Kingston; first vice president, J. A. Cubble, Montreal; second vice president, H. Hammond, Toronto; secretary, Francis King, Kingston; executive committee, H. W. Richardson, Thomas Donnelly, John Gaskin of Kingston, J. H. Hall, D. Murphy, M. P., of Ottawa; R. C. Carter of Desoronto, R. O. MacKay of Hamilton, A. A. Wright, S. Crangle of Toronto.

A sub-committee of the association waited on the minister of marine to discuss the steamboat inspection act, and on March 30 had an interview with the steamboat inspection board on the same subject.

The new five-masted schooner Gardner G. Deering, lies in 60 ft. or more of water in the bottom of Chesapeake bay, off the mouth of the Potomac at Point Lookout. She will be raised by means of floats by the Merritt-Chapman Wrecking Co. The Deering was sunk in a collision with the Merchants & Miners' steamer Essex.

The Admiral Faragut of the United States Steamship Co.'s fleet reached Boston this week in a disabled condition and will have to go into dry dock.

MEETING OF LAKE UNDERWRITERS.

Buffalo, April 5.—The lake underwriters held their rate meeting here on the 30th and 31st of March and appear to have transacted about all the business that was naturally ready for them to do and then spent the usual interval in informal visiting from office to office here before returning home and to business. It is quite proper to say that they "appear" to have done this or that, as the body is a very irresponsible one as regards the general public, no matter how severely responsible the members may be to each other, so that really no information was given to the press officially and all that could be obtained was culled piecemeal, as usual, from one or another of the attendants.

There is no real organization, so that the meeting had to begin by selecting its officials, J. S. Gadsden of Chicago being chosen chairman and A. H. McDonnell of Detroit, secretary. The other attendants were C. W. Elphicke, O. G. Orr, J. S. Wall, George McCurdy, F. H. Osborn and S. J. Dow of Chicago, F. L. Vance of Milwaukee, J. H. Platt, Hugh Grundner and H. Haltermann of New York; H. S. Sill and D. H. Wilcox of Buffalo and Sidney Crocker of Toronto.

There appears to be no longer any supreme authority maintained in London in marine insurance matters on the lakes further than is wielded by the New York representatives of those interests, so there was no adjournment, as is sometimes the case, to find out whether the foreign underwriters will consent to this or that which is proposed by the meeting. All that was taken up was disposed of before adjournment.

There seems not to have been any very definite "slate" prepared beforehand, or if it was it was not put through, as some of the undertakings of the first day were negatived later on. The first semi-official report of hull rates was that they had been raised on wood from 1 to 1½ per cent., but the final report was otherwise. It had been predicted some time before the meeting that rates would likely be left the same as last season, but that the form of policy for wood hulls would be changed to meet the requirements.

The fact was that the steel-hull rate was left unchanged, and also the form of policy, while certain of the rates on wood hulls were raised. On comparing notes it was found that it was the high-grade wooden vessels that had cost the companies money last season, while both A2 and B1 wood had been profitable, so it was agreed to advance certain of the A1 and A1½ wood class moderately according to the showing. It was also found that the losses varied according to a certain line of valuation, so this showing was made use of as far as possible. It will have to be accepted that the rates put into force must be fashioned to meet a decidedly passing peculiarity, as they are not common in lake business, and it is stated that till the actual schedule is published by the secretary, which ought to take place this week, it will be impossible to describe the rates.

Probably it will not be necessary to repeat this classification, as the wooden lake hull is fast going out of existence, the A1 being pretty nearly gone now and the next class not being at all numerous. There is a constructive reason as well as an operating reason for this decline, as it is found that the revival of canal-boat building this year makes it necessary to ship timbers all the way from the Pacific coast for the bottom and sides of the boats. A lake barge was given new deck beams of oak at Black Rock during the winter, but it was almost impossible to find the timber.

The appearance of the preliminary sheets of the Inland Lloyds vessel register shows really more significant changes than were attempted by the underwriters at the late meeting. Practically all wood hulls were cut down in valuation very severely, some of them as high as 35 per cent., which means that in not a few cases more insurance will have to be paid on considerably less actual property than formerly. There

was some reduction of the valuation of steel hulls also, the amount often running about \$20,000 each.

There was something done by the underwriters in cargo insurance, but they did not take a very bold stand in the matter. Rates on lumber and grain were left unchanged, but coal and ore were not fixed. Coal insurance is much of an individual affair and as to ore it does not seem to be known what will be done, for really nobody wants to touch it. The reason is plain enough, for there was one underwriter at the meeting who had sustained six total losses during the past season on ore. It is likely that someone will take the matter up. All the former companies are in lake business but the Greenwich.

JOHN CHAMBERLIN.

LARGEST STEAMERS ON THE PACIFIC OCEAN.

San Francisco, April 1.—The Mongolia and the Manchuria, which will be the largest steamers on the Pacific ocean, will soon reach San Francisco. The former, under the command of Capt. Rinder, is already on her way, and her sister ship will follow in a few weeks. They are owned by the Pacific Mail Steamship Co., and will run between San Francisco and the ports of the Orient. Capt. J. W. Saunders, at present on the steamer Newport, has been chosen to take command of the Manchuria.

The new vessels have been thoroughly inspected by naval experts, and have been pronounced the equals of any ships afloat. They will prove very valuable in increasing the capacity of the port of San Francisco to control the growing trade with Oriental countries. The Manchuria can carry 14,000 tons deadweight of cargo; 450 first-class passengers and a crew of about 250 in all; her average speed is 16 knots.

Both vessels possess the most modern devices for handling freight and will be far ahead of the wharf accommodations of the port of San Francisco, which are very defective. Though the wharf of the Pacific Mail Steamship Co. is the largest in the port, when one of the big vessels (Siberia or Korea) has discharged her cargo merchandise is piled up to the roof on every available square yard of space. To move the merchandise is a tedious job, as it is difficult to reach it. Besides the waste of time and energy involved, the piles of merchandise would entirely prevent the fire department from rendering any service in case of emergency. If a fire broke out on the wharf thousands of tons of merchandise would be at its mercy.

With the view of remedying these defective arrangements, plans have been prepared for three new wharves having double decks. The harbor commissioners have promised to begin their construction as soon as possible. Until new wharves are ready for use the Mongolia and Manchuria will only add to the congestion already severely felt at this port.

Experiments have been made at the New York navy yard under the direction of Capt. J. A. B. Smith, head of the steam engineering department, in manganese bronze, to determine its adaptability in parts of machinery for warships. About three weeks ago the first castings of pure manganese bronze propellers were made by experts at the navy yard. The principal advantages of the manganese bronze propeller are that the blades are thinner and lighter than those made of gun metal, and the hardness of manganese bronze is like that of mild steel. The more recent experiments have been a test of forging manganese bronze, the first ever made at a navy yard, and they have been successful. From a cast billet a bolt about 4 in. in diameter and 10 in. in length was forged, and the tests with the metal, after forging, gave a tensile strength of 69,000 lbs., an elastic limit of 48,000 lbs. and an elongation of 26 per cent. Corresponding tests in private works showed a tensile strength of about 60,000 lbs., an elastic limit ranging from 35,000 to 40,000 lbs. and an elongation of from 12 to 22 per cent.

LABOR CONFERENCES IN CLEVELAND.

The present week has been marked with conferences in Cleveland between the dock managers and representatives of the International Longshoremen, Marine & Transport Workers' Association, between the Great Lakes Towing Co. and the Licensed Tugmen's Protective Association; and with the deliberations of the advisory board of the American Association of Masters & Pilots. The dock managers and the longshoremen have practically settled every issue between them except the vital one of wages and hours of labor. The men are making a strenuous effort to have the hours reduced from eleven to ten, but this point has not been conceded by the dock managers, and will not be. The men originally stood out for last year's schedule of wages, but during the early part of the week manifested a willingness to accept a light cut, though not as much as the dock managers thought they should. It looks as though a compromise would be effected upon a basis of a 10 per cent. reduction.

It is not expected that any difficulty will be experienced in arriving at a satisfactory settlement between the Great Lakes Towing Co. and the Licensed Tugmen's Protective Association. The towing company had a great deal of trouble with its men last year, as a result of which the service was crippled in Cleveland seriously. The company held that the men quit work without warrant and the arbiter to whom the agreement was submitted has so held. Mr. Harry Coulby, who was the president and general manager of the towing company at the time, told the men that if the company was in error, it would compensate the men, but if the men should be in error he would expect them to compensate the company. A claim, therefore, amounting to \$1,470.70 has been presented to the Cleveland lodge of the Licensed Tugmen's Protective Association for damages done to the company through unwarranted idleness on the part of the men. This claim should in equity be paid, but it is likely to be the subject of considerable debate. Concerning the hours of work and schedule of wages there will probably be no difficulty in adjusting as the company is quite willing to pay good wages for good service. The members of the advisory board of the American Association of Masters & Pilots are meeting in Cleveland to alter the classification and wage schedule as adopted at the Port Huron conference last January. The classification is quite peculiar and has created some dissatisfaction. The wage schedule has also been the subject of considerable discussion and it is probable that changes will be made in both. A successor will also be appointed to Capt. Charles Maytham, who has resigned as district captain. Capt. Frank Danger of Port Huron is among the foremost candidates for the office.

From the vessel owners' standpoint preparations for the season of 1904 are practically no further advanced than they were a month ago. Neither captains nor engineers have been employed, nor have any conferences been held with them to fix the schedule of wages, nor have any of the owners any idea as to when the operation of vessels will be begun.

NEW LIGHTER FOR GREAT LAKES TOWING CO.

The Great Lakes Towing Co. has given a contract to the American Ship Building Co. for a steel lighter, to cost approximately \$55,000. The lighter will be so constructed as to be capable of doing outside as well as inside work. The lighter T. F. Newman, which has been operated successfully in the Detroit river during the past two years, is primarily a river boat; but the new lighter will be expected to work in open water as well. She will have a square stern, but unlike the Newman, will be sharp forward. The new lighter will be 180 ft. long, 36 ft. beam and 15 ft. deep and is to be finished by June 10. This will give the Great Lakes Towing Co. three lighters—the Active stationed at Amherstburg, the Newman to be stationed at Detroit and the new lighter to be stationed

at the Sault. She will be built at the Cleveland yard of the American Ship Building Co.

GOVERNMENT DREDGES ON THE GREAT LAKES.

President Roosevelt has during the past week or two been giving consideration to the complaints of private dredging interests on the great lakes that their business has been put in jeopardy by the invasion of the field of dredging by the federal government. It is known that the government is constructing two dredges for use on the great lakes, one on Lake Erie and the other on Lake Michigan. It appears that the Lake Michigan dredge was ordered by the war department without specific authority. The president has referred the subject to Secretary of War Taft, who has now asked the attorney general for his opinion as to the authority for its construction. A very ingenious argument is being made by the army engineers in favor of the construction of dredges for their personal use. The argument is that the government dredge will make more work for private dredging interests. As to how this can possibly be must be left to the mind of the government engineer alone to comprehend. It is the common belief that if two men do a piece of work they will each have less to do than if either did the whole piece alone, but this is apparently disproved by the engineers. They maintain that if they keep the other harbor to a certain depth it will compel the municipality to keep the inner harbor to a corresponding depth and that will secure more work for private dredging interests. It would also make more work for the private dredging interests if they were permitted to keep the outer harbor to the corresponding depth. It is expected that Attorney General Knox will render his opinion shortly.

PASSENGER STEAMER APPOINTMENTS.

Appointments of masters, engineers, pursers and stewards of the combined fleets of the Detroit & Cleveland, Cleveland & Toledo and Detroit & Buffalo lines have been made by Gen. Supt. Schentz for the season of 1904. No pilots have been selected, pending a settlement of the wage scale. Following is the list of appointments:

Steamer City of Alpena—Captain, M. Lightbody; chief engineer, Ammon Phillips; purser, R. S. White; steward, Chas. P. Derr.

Steamer City of Mackinac—Captain, F. J. Simpson; chief engineer, William McDonald; purser, George Masson; steward, John B. McLean.

Steamer State of New York—Captain, Salem Robinson; chief engineer, William Steen; purser, John Barry; steward, Julius Wehlann.

Steamer State of Ohio—Captain, Alex. McLachlan; chief engineer, David Donaldson; purser, George F. Sladden; steward, Richard Collins.

Steamer Western States—Captain, Frank Stewart; chief engineer, Andrew Carter; purser, Duncan McIntyre; steward, W. L. Garrison.

Steamer Eastern States—Captain, Duncan McLachlan; chief engineer, J. P. Wells; purser, John Sughrow; steward, Otto Hunter.

The City of Detroit will be commanded by Capt. A. J. McKay and his steward will be Alfred Welfare, formerly of the Mackinac division. Capt. Archie McLachlan will sail the City of Cleveland.

No action was taken upon the labor question at the monthly meeting of the board of managers of the Lumber Carriers' Association in Detroit this week. All questions pertaining to labor and season contracts were placed in the hands of committees and it is not likely that any definite move will be made before the next monthly meeting. No attempt has yet been made to fix carrying charges for the season, the labor problem being so uncertain.



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The United States stands pre-eminent among the nations of the world in industry, commerce and finance, and it is conceded the world over that protection has produced the conditions that are so greatly to our advantage, just as free trade has produced the shrunken and decayed condition of our deep-sea merchant marine. Some people think we should remedy this condition by giving American registry to foreign-built ships. But how ridiculous this suggestion is! In the first place Americans now possess a vast fleet of foreign-built ships that they have been able to purchase on the same terms as their foreign competitors have purchased their ships, and these American owners of foreign ships are able to run them under foreign flags with foreign officers and crews as cheaply as their foreign competitors run their ships. So circumstanced American owners of foreign vessels earn as large profits upon their vessels as their foreign competitors do. But if they should place these vessels under American registry, and be compelled, as they at once would be, to employ American officers, and to conform the victualling of the ship according to the American food scale at an expense about 35 per cent greater than their foreign competitors are subject to, where would there be any advantage in such a change? Why should an American owner accept for his foreign ship an American registry when such registry involved him in so much greater an expense in operating his vessel that he could not earn a profit with her? Do we hear Amer-

ican owners of foreign ships pleading with congress for American registers for them, in order that they may thus engage in our foreign trade? There is not one voice so raised; all of those who own foreign vessels for which they seek American registry are merely seeking to invade our coastwise trade, a trade that for more than a century has been exclusively reserved for American vessels.

The United States government pays \$50,000,000 for the right of constructing a canal across the Isthmus of Panama, \$40,000,000 of which goes to the private company that undertook the work and \$10,000,000 to the state, and after that it is estimated that the cost of completion will amount to \$144,000,000 more, or approximately \$200,000,000 all told.

"We will dig the canal," said Secretary Root in his famous Chicago speech, "not with selfish reasons, not for greed of gain, but for the world's commerce, benefiting Colombia most of all. We shall not get back the money we spend on the canal any more than we shall get back the money we have expended to make Cuba a free and independent republic, or the money we have expended to set the people of the Philippines on the path of ordered liberty and competency for self-government. But we shall promote our commerce, we shall unite our Atlantic and Pacific coasts, we shall render inestimable services to mankind, and we shall grow in greatness and honor and in the strength that comes from difficult tasks accomplished and from the exercise of the power that strives in the nature of a great constructive people."

Thus communication between two great oceans is to be made possible and thus commerce is to be relieved from the trials and perils of 9,000 miles of navigation around the Horn. The canal, when completed, is to be open, neutral and free upon equal terms for the use of all mankind. As to what its real commercial value may be, the future alone can determine. It will probably not for many years be the commercial artery that the Suez canal is, for there is the great point of difference that while the Suez connects two densely populated territories, Panama connects two wide oceans. On one side of the Suez are the teeming millions of the Orient and on the other side are the shops of Europe. The commerce of Suez is approximately 10,000,000 tons per annum, and it is not expected that the commerce of Panama will be half that figure for a great many years. Just as an item of comparison it might be stated that the commerce of Sault Ste Marie canals amounted in 1903 to 34,600,000 tons while that of Philadelphia was 6,827,022 tons, Baltimore 7,795,580 tons, Boston 9,016,792 tons and Buffalo-Niagara 12,710,000 tons.

Secretary Root, therefore, says very truly that the canal is not constructed for gain. It will be very fortunate if it can meet its interest charges. But nevertheless Panama means much to the nations of the world and to the United States most of all.

Politically its advantages cannot be overestimated. It cements the nation far more thoroughly than did the railways across the continent during the civil war. It will forever prevent the strain and worry of such a trip as the Oregon took in the early days of the Spanish-American war. It will bring the countries of the western coast of South America within convenient reach of the eastern coast of North America.

Secretary Cortelyou, in the March 10 issue of the *Marine Review* predicted that the Panama canal would create a demand for American sea-going cargo steamers, which might do as much for American builders on salt water as the development of the great lakes ore regions has done for builders on fresh water.

An opportunity now presents itself for the canal to be of immediate benefit to American shipping. The canal's zone is the property of the United States wholly and absolutely by right of purchase. It is under the jurisdiction of the American government and is part and parcel of the United States of America. Politically it is territory of the United States, and the navigation laws of the United States should be immediately extended to embrace it. American ship owners have both a moral and legal right to demand that the canal zone be included in the coastwise service, which means that all commerce between one American port and another should be carried by an American ship. The canal is to be built by American money and American brain, through American territory, and the tax payers of America will be called upon to foot the bills, and the material which American money purchases should be carried to the canal zone in American ships. For eight years there will be a constant consumption of machinery, material and provisions along the line of the canal, and every pound of it should give employment to some American ship. It is estimated by the members of the canal commission that from five to ten million dollars' worth of new machinery will have to be purchased to replace the useless stuff now on the isthmus. Every ounce of this should go forward in an American ship.

The American ship indeed has very little to do. The foreign trade carried in American bottoms has dwindled so that scarcely 8 per cent of it goes abroad in an American ship.

The astonishing statement that the last ship for the foreign carrying trade of the United States has just left the stocks, and there is none other to take her place, and upon our law makers at Washington must be placed the responsibility for this great national humiliation to our American patriotism and American pride. Shipbuilding for the foreign trade is as dead as the proverbial door nail. Two splendid steamers, the *Minnetonka* and the *Minnewaska*, built in sections on the great lakes and joined together at Montreal, have been swinging idly at their moorings, representing a dead loss to their owners, because there is no cargo to be obtained, and there is not an American

harbor on either coast that does not contain a greater or less amount of idle American tonnage, while side by side with them can be seen the many English, German, Norwegian and Italian steamships carrying not only the commerce of foreign countries, but 92 per cent of the commerce of the United States.

By preserving the forwarding of supplies to Panama by coastwise ships, considerable trade can be divided among the ships now in that service and whose owners are being heavily taxed to maintain Uncle Sam's reputation for good nature and philanthropy to his foreign cousins.

Mr. Root does not claim and no one claims that the Panama canal is being constructed for American commerce, for American vessels, for American shipping.

If our flag and our vessels are to continue to disappear from the oceans during the next few years as they have in the past ten, there will not be one left to engage in the foreign trade when this canal is finished. They will all have disappeared for years and years before that time, even if it is completed in the eight years predicted by some of the Panama enthusiasts.

It is a duty which the nation owes to the capital which has honestly gone into American ship owning. What would this nation be without ships? Why should it not, therefore, encourage American shipping whenever it can? Here is an opportunity to do it legitimately and it should be immediately seized upon.

It does not require any complicated legislation, the adoption of any new principle, or the expenditure of any great sum of money, but simply the extension of a well-known and universally approved policy upon which all parties in our national legislature have been agreed. No more favorable opportunity could arise to fulfill some of the many promises and pledges so frequently made for many years by the party in power than the one indicated. Our government at Washington has appeared to have millions of money whenever it has been wanted to assist the indolent Cuban, or the uncivilized Filipino, or to provide a navy for the protection of—What? Not our foreign shipping or commerce—there is no longer any.

The policy or the lack of policy that has been pursued thus far has been one to benefit foreign trade, foreign governments, foreign ship owners and foreign ship builders only, and by inaction to drive every American flag from the seas and fill our ocean harbors with American ships to rot and rust while we spend our money and tax our people for the benefit of other nations who may not be even grateful.

Divided among the ships of the world, the business that is to forward to Panama would not amount to much, but concentrated into the coastwise service it would make a profit where now there is nothing but loss. Let the American government do this little for the American ship.

Ship Canal Around Niagara Rapids.

Powerful Arguments for the Extension of Deep Draught Navigation at the Foot of Lake Erie to Relieve the Congestion of the Country's Commerce.

Very important and very interesting indeed was the hearing before the committee on rivers and harbors of the house of representatives at Washington on March 27 to urge the extension of deep draught navigation around the head of the Niagara rapids into the still water below by means of the construction of a ship canal. A delegation of uncommon influence appeared before the committee to advocate the improvement. A vast array of facts were dealt with and practically unanswerable arguments were advanced in favor of the improvement. There appeared before the committee the following gentlemen: Mr. George P. Sawyer, chairman of the delegation from Buffalo; Gen. Francis V. Greene of Buffalo; Mr. James J. Hill of St. Paul, president of the Great Northern railroad; M. William A. Rogers of Buffalo, president of the Tonawanda Iron & Steel Co.; Mr. John Cunneen, attorney general of New York state; Mr. William Livingstone of Detroit, president of the Lake Carriers' Association; Mr. Harvey D. Goulder of Cleveland, counsel of the Lake Carriers' Association; Capt. J. J. H. Brown, president of the Buffalo Chamber of Commerce; Mr. John A. Penton of Cleveland; Mr. George A. Tomlinson of Duluth; Col. Thomas W. Symons of the corps of engineers, United States Army; Mr. Edward A. Bond of Albany, state engineer; Mr. F. L. Lovedale, Niagara Falls; Mr. Charles Hill, North Tonawanda, N. Y.; Mr. Harvey L. Brown and Mr. George A. Ricker, Buffalo, N. Y., and F. Howard Mason, secretary of Buffalo Chamber of Commerce.

The committee had assigned only two hours to the hearing and, therefore, no time was lost in getting down to business. Mr. George P. Sawyer, chairman, was the first speaker. He said:

"Our delegation has come here to plead with you for a proper relief for the congestion at the foot of the great lakes. The gentlemen who have come are from Duluth, and from New York, and from everything in between, with Mr. Hill of the United States; and we have with us the attorney general of the state of New York and the state engineer and surveyor, who are both members of the canal board. We have a letter from Governor Odell, which will be presented at the proper time; and it is unnecessary, I believe, sir, to say that we are all equipped to answer your questions and are only too willing to be broken in upon at any moment. Gen. Greene, who was the president of the Roosevelt commission which formulated the great barge canal, is here also, and after four years of work that canal has been adopted and formulated and decided upon, and practically commenced; and after Gen. Greene gives you a brief account, perhaps, of the physical position of the ship canal that is proposed, and has made reference to maps, which are somewhat plentifully scattered around, I will ask Mr. Milburn, of New York, to present our case.

GEN. GREENE'S SPEECH.

Gen. Greene said: "I shall confine myself to stating as briefly as possible what the proposition is, and why we have asked for this hearing and what we ask you to do, leaving to others more capable the task of presenting facts and arguments in support of the proposition. The state of New York, by a vote so large that it cannot be overturned, and after four years of deliberation and discussion, has decided to expend \$101,000,000 in creating a new canal across the state of New York, thus restoring the great waterway between the wheat fields, the iron mines, and the lumber districts of the northwest and the Atlantic ocean. This canal reaches the navigable waters of the United States at Tonawanda, on the Niagara river, where there is really the only fine harbor on the

great lakes. This harbor is a portion of the Niagara river, about a mile wide, with a depth of 25 ft. of water, and with an average length of nearly 20 miles between that harbor and the great lakes. There are rapids running over the rocky lip or mouth of Lake Erie, over which the water is now only about 14 ft. deep. What we ask is that the United States government build a ship canal $3\frac{1}{2}$ miles long through these rapids, which will enable the largest ships through the lakes to reach the harbor, and there join with the commerce of the canal. In asking this we do not come here as a Buffalo committee alone. We claim that every interest and every state that borders the whole of the lake system of the northwest is quite as much interested in this project as are the city of Buffalo and the adjoining cities of Tonawanda and Niagara Falls. The commerce of Buffalo, in and out of Buffalo on the lakes, is already far greater than that of Philadelphia or Baltimore. It is one-fourth larger than that of all the Pacific ports on the coast of the United States combined. When the canal is completed across the state of New York, the amount of this commerce will be doubled, and there is no way in which commerce coming into Buffalo by lake vessels can be handled now except by some ship canal project such as that which is now before you.

"Last winter, or more than a year ago, the project was examined by the engineer officers, and is before you in the shape of a report from the board of engineers, stating that in their judgment it was not advisable that this project should be commenced at the present time, although they thought it would be of great benefit when the canal across New York state was completed. We wish to present to you that now is the proper and accepted time to begin this great work, and we ask in order that this may again come before the board of engineers, that a small appropriation, of say \$2,000, be made in the emergency river and harbor bill for a further examination and report upon the Black Rock harbor. That, in substance, gentlemen, is the outline of our proposition, on which others will elaborate.

The Chairman. "There are two or three questions, Gen. Greene, which I would like to ask. The enlarged canal terminates at Tonawanda?"

Gen. Greene. "Yes, sir."

The Chairman. "There will not be a 12-ft. channel?"

Gen. Greene. "No, sir; the canal between Buffalo and Tonawanda is to be retained as a feeder, but not as a part of the new barge canal."

The Chairman. "Your figures do not correspond with the official statistics as regards Philadelphia and Boston. According to the statistics, the figures of Philadelphia amount to over 20,000,000. The treasury department statistics, strictly speaking, only include the foreign tonnage. There is a great domestic tonnage there."

Gen. Greene. "I understood the figure of 8,000,000 included both foreign and domestic."

The Chairman. "We have tried very hard to get some reliable and satisfactory tonnage statistics. The magnitude of the tonnage depends somewhat upon the care with which statistics are taken in their respective ports. I am inclined to think they take them as carefully in Philadelphia as they do elsewhere."

Gen. Greene. "The figures I used were compiled by the Chamber of Commerce of Buffalo. I understood they were between 8,000,000 and 9,000,000 for Philadelphia, including the coastwise commerce."

The Chairman. "It has been decided by the committee that no provision for surveys could be made at this session of

congress. You can hardly realize how difficult it would be for us to pick out any one project and favor it to the exclusion of the others. We concluded it was necessary absolutely to reject all propositions, because if we should select one it would be necessary to select a hundred. Possibly by some reference back to this board of engineers, by a resolution or otherwise—"

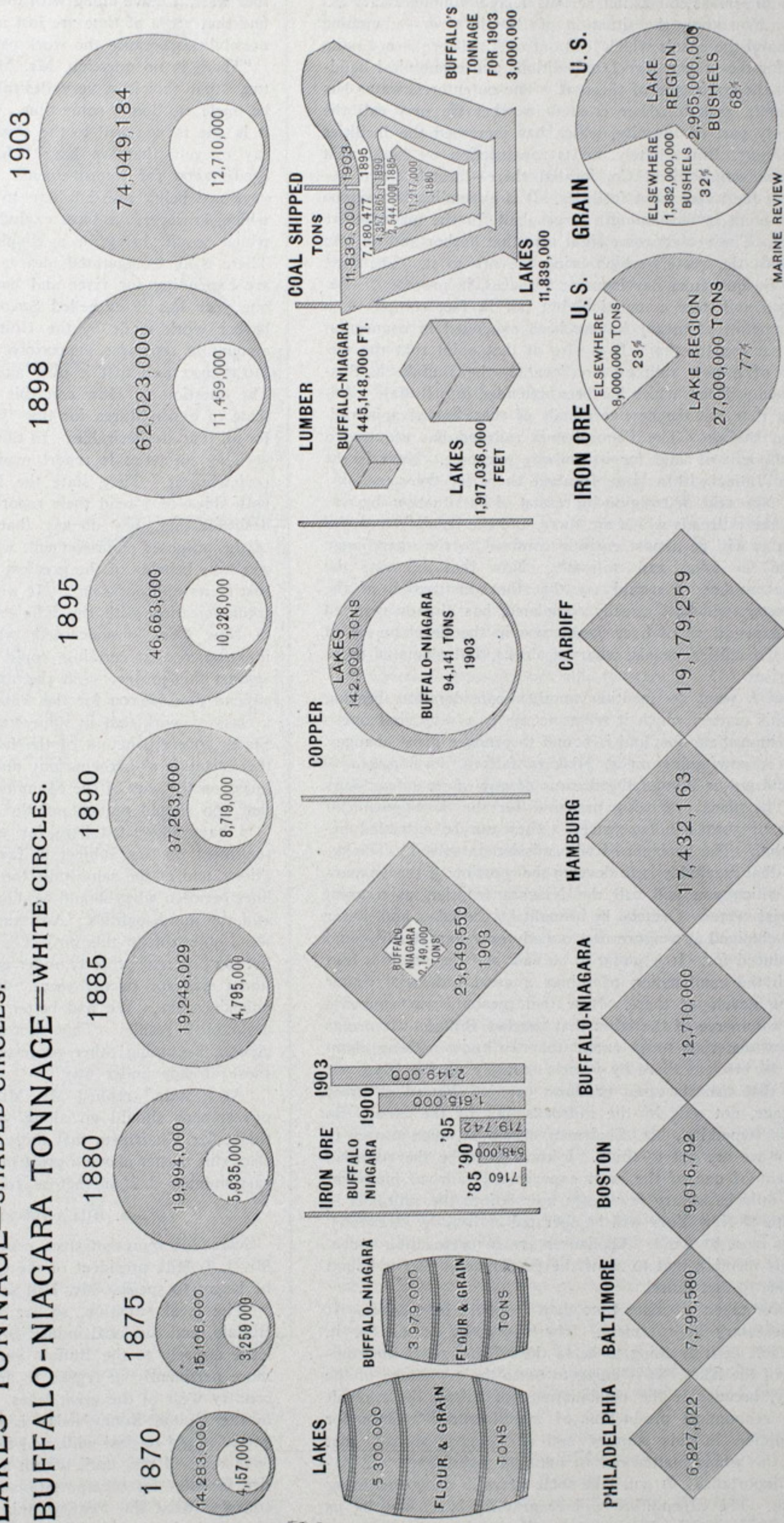
Gen. Greene. "All we desire is to have some reconsideration of the matter, in view of the change in the situation since the board of engineers made their report. At that time the state of New York had not decided on the barge canal question."

MR. MILBURN'S SPEECH.

Mr. John G. Milburn of New York spoke as follows: "What I have to say will be directed to the question of the real necessity of this proposed improvement. The general purpose of it is, as you know, to extend the deep waterways of the lakes to the deep waters of Niagara river just below the rapids. That can be accomplished by the building of this ship canal. When it is done the largest vessels on the lakes can go from a western point, say from Duluth, Minnesota, right to this portion of the Niagara river, which by this improvement is opened for docks and wharves. Very quickly, I imagine, the question would arise as to the necessity for such an extension of facilities with reference to the commerce of the lakes. Let me say a few words to you about the present situation, and about the condition of things there which I may fairly say is immediately in sight. The people acquainted with the conditions at Buffalo will inform you that the present facilities for handling the lake commerce

LAKES TONNAGE=SHADED CIRCLES.

BUFFALO-NIAGARA TONNAGE=WHITE CIRCLES.



(REGISTERED TONNAGE)
GRAPHIC REPRESENTATION OF THE GROWTH OF GREAT LAKES AND BUFFALO-NIAGARA COMMERCE.

results in serious congestion, serious delay and unnecessary expense. You know the situation of Buffalo river—a winding river—and the canals which lead out of it. There is not room there for the proper, direct, expeditious and economical handling of the commerce of the port. The outer breakwater has been built, and a harbor created in what we may call the southerly part of the city, which has increased the facilities of the port. Immediately on its construction we know that the Lackawanna Steel Co. located there—located there because of the water front facilities. It is expending \$50,000,000 at that point in developing a large plant for the manufacture of steel. The vessels come right into that harbor and go into its docks, the vessels which bring the ore to it. The next is the Susquehanna development furnaces, in process of construction and near completion, but not in fact completed, a large amount of money having been expended in connection with that construction. It is also at that point that the terminals of a new railroad are located—the Buffalo & Susquehanna railroad, which has been extended into Buffalo. Adjoining that run the new terminals of the Pennsylvania railroad in Buffalo. The Pennsylvania railroad has acquired a large amount of land for its railway purposes. Next is the Lehigh Valley with a large frontage there for the same purposes. You take that region by reason of its situation, by reason of the railroads which are there, and the result is and will be that it will be almost entirely confined to the interchange between the lakes and railroads. Now that exhausts the facilities to-day. I would say that the construction of the breakwater, which is already completed, has already resulted in an expenditure of over \$70,000,000 in the development of terminal facilities, canals, wharves, docks, and plants of those enterprises.

“Now I want to mention another consideration bearing upon this matter, which it seems to me is a very vital one—a very immediate one, and is bound to produce great changes. There is now going on at Niagara falls a development of electrical power beyond the dreams of any of us a few years ago. The plans are being prepared for the development of 400,000 or 500,000 horse power. They can be extended beyond that. The problem of transmission is solved. The result of that inevitably is to develop that portion of the Niagara river, which you will call the Niagara frontier, as a great industrial center. Ore can be brought by the lakes and power can be obtained at a figure that nobody ever expected it could be produced for. It is going to be had, and the result is that through the combination of things a great industrial center is being developed there. Now that means a vast increase in the commerce of the lakes that touches Buffalo. It means that raw materials to an extent that we know nothing about are to be brought there by vessels that ply on the lakes. It means that manufactured products can be shipped at great advantage, not only by the railroads, but by the canal. So there is something, Mr. Chairman, which is much nearer to us than we are apt to think. I know it to be the recorded judgment of one of the most experienced railroad men that it will only be a very few years now before the railroads in the state of New York will be operated entirely by electricity. That is close at hand. Appliances are in preparation for it. I merely mention that to show the development that is bound to be due to that cause.

“I have taken up more time than I should have taken. It is a necessary improvement. There is every reason for it. The result of it is going to be to the advantage of the commerce of the lakes. It is going to be to the advantage of the country, because if the combinations of things there result in the economical production of manufactured articles for consumption in this country and for export abroad, that makes the whole matter one of national significance and national importance. It will take some years to carry this thing through. The expenditure will be gradual, but I say, let us move along. I ask congress to authorize it to be done, so

that we can move along with the other developments, and not find that years of time are lost in the full realization of these possibilities because the work can not be done.”

“There is no question, Mr. Milburn,” said Chairman Burton, “that this is a very desirable improvement, and it will be made, no doubt, some time. But I should say to you, and it is due to you and to the committee as well, that I should say to you, that we have before us estimates aggregating \$500,000,000 for improvements in the United States. Surveys are being pressed here to the number of 100 or 150, which, however, we have excluded and decided not to make, which would bring in a couple of hundred million more. There is an exaggerated idea as to the amount of money we are expending for river and harbor improvements. In only one year has it exceeded \$20,000,000 for all the river and harbor work made by the United States government. The amount in 1893 was \$14,000,000, and in the year 1903 it was \$19,390,000, and that is over against \$500,000,000 of projects. The question is, How can this committee, with the present scale of expenditures for this class of improvements, provide for all that are desirable? In this particular instance there has been an unfavorable report made by the board of engineers reviewing it. They state the features of the situation on both sides, as I read their report. They do not say it is not desirable, but they do say that, considering the great cost of the proposed improvement, which they estimate at \$4,500,000, only benefits of the greatest commercial magnitude would justify its appropriation. It would seem that, so far as the communication with the Erie canal constructed by the state of New York is concerned, which certainly is of national importance, that certainly could not be used as an argument against this project—that the state of New York is going to expend \$100,000,000 for the waterway across the state. It is a class of work that in some states is paid for by the United States government out of the federal treasury. I do not say this certainly as showing any unfriendliness, or any unfriendliness on the part of the committee; but I think it is only due that you should understand the situation.

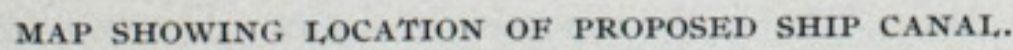
“I have advocated here for years the education of public sentiment on this subject in favor of more liberal appropriations, and at the same time the more careful drawing of the lines between what should be done by the national government and the municipalities. And another thing that does present some objection to this project is this: We now have on the list 603 different projects under way. Some of these have been under way for twenty years. It is perfectly clear that it is unbusinesslike. We had better finish what is necessary and accomplish results. That fact presents a decided argument against beginning other projects until we complete some of those already under way.”

“As a state,” replied Mr. Milburn, “we think the federal government should go along with us in this work, and I think, Mr. Chairman, that those are influential reasons which place this matter above a great many other projects—above the vast number that are before you.”

MR. HILL'S FORCEFUL REMARKS.

Scores of representatives crowded into the room to hear Mr. J. J. Hill, president of the Great Northern railway, when he began to speak. Mr. Hill said:

“The local situation, so far as it concerns the people of Buffalo, and the local industries there, and all of that, I will leave entirely to the Buffalo gentlemen, because I can speak more pertinently in regard to and have more interest in the country west of the great lakes. The transportation question in the United States today is the most important question you have got to deal with, and few men, and few railway men have realized that until within a very short time that the entire facilities for transportation are totally inadequate. Now, consider what the Pennsylvania railroad is doing. A great many people are criticising Mr. Cassatt, but Mr. Cassatt



you cannot handle it in the terminals; and the city on the railway, or the city on water navigation without terminals is like a man without hands and feet—absolutely helpless.

"To illustrate: In 1896 I think I am right in saying that 9,000,000 tons of iron came from Lake Superior; in 1903, 28,000,000 tons. It is about as easy to say 28 as 9. Where did they go? Largely down the Mahoning Valley and down the Pennsylvania. Within three weeks mills in Minneapolis have had to close down because they could not get their flour moved east. Shipping flour to the cities in Europe, and each ship giving them thirty days within which to get their flour from Minneapolis to New York alongside the ship. And, there is not a railroad that would give them a contract or a bill of lading to do it. The baker has had to order two cars of flour instead of one, thinking he would stand a better chance of getting what he wanted by ordering twice as much as needed.

“That is the situation today, and it is a situation that cannot be remedied in a short time. If you wait until six or seven years roll around, it will have remedied itself in other directions. Now bear in mind, if you please, that a great deal of our grain from the northwest goes east by the lakes. Your friends north of the international boundary line have been active. There is a low grade railroad from the Ottawa river to Parry Sound. Parry Sound is from Duluth about the same distance, or a little less, I think, in miles than it is to Point Edward, which is the outlet of Lake St. Clair. At Parry Sound they strike a low grade railroad running from Montreal, at a shorter distance from Buffalo to New York. They are getting into the business of our country in an enormous way. We are very glad to have it carried, because the American lines are not able to carry it.”

"The American railways are not able to carry it?" queried Mr. Burton.

"Yes, sir," responded Mr. Hill. "They are not able to do the business which they have got to do, and it is overflowing in every direction—in one direction and another, and the measure of our facilities is not great enough to handle, and they have not comprehended it. I will illustrate it. Ten years ago the cars in the United States—the average car—moved in 24 hours about 32 miles. These are all official figures made to congress. Last year the average car moved less than 20 miles in 24 hours. A freight train moves 10 miles an hour, and you can only move your cars 2 hours out of 24, or a distance of 20 miles. It is a dreadful tax to say that your facilities can only be used 2 hours out of 24, because they run day and night. That is the situation that is before the country. This is one of the most important things that can possibly come before congress, whether this canal cannot be finished before seven or eight years, or if it can be finished tomorrow. Is there anybody else who can go and improve that United States waterway?"

"Permission will be given for that if anybody asks it," said Mr. Burton. "I think it will be very cheerfully given, Mr. Hill."

"Within three miles of my house," continued Mr. Hill, "there is a canal being built to facilitate the navigation between Fort Snelling, and the State University. I think it will cost a million dollars, maybe a million and a half. I will undertake to say that during the first five years there will not be 25 craft with steam power go through the canal, unless it is some boy's boats. It will afford a nice place for boat races for the State University, but so far as any commercial uses are concerned it will have none that might ever be conceived. There are many other illustrations that I could mention of the same mistaken policy."

"The argument in favor of that lock was that it changed the head of navigation on the Mississippi river from St. Paul to Minneapolis," said Mr. Burton.

"But there is no navigation," replied Mr. Hill. "There is nothing there. The Mississippi river's clock struck twelve

twenty years ago, and it will never strike again. You might as well try to lath and plaster the bottom of that river as to build this lock. But I will not digress further. Now, taking the rate from the western ports to the lower ports, it costs as high a rate on grain to bring it from Duluth to Detroit, as to Buffalo. The farther you take it, the less you have to pay the rest of the way. I had some experience in this matter a few years ago. We could not get east from the northeast, except at Chicago rates, even if we went by way of our own lake ports. It cost as high as it did to go around by Chicago. I built six steamers. The first cargo landed in Buffalo at the New York Central docks, and the captain was notified that they would take our cargo of flour, 20,000 barrels, for New York at the local rates, which was practically the same as it was from Chicago, and practically the same as it was at Duluth, so that we would have the privilege of carrying it down for nothing. We expected that, and we landed it at the Lackawanna, because they offered to give us the divisions. In 14 years we were able to settle that question.

"Later in Buffalo there were elevator charges that were enormous—a cent and a half, and a cent and a quarter, and a quarter of a cent for shoveling; and on over 200,000,000 bu. of grain it amounted to over \$3,000,000 a year. I thought the easiest and quickest way to accomplish something that ought to be done, was to go at it and do it, and we built a steel elevator, a very expensive one, at Buffalo, and the rate has been reduced to half a cent.

"Now I want to say to you one thing. While I sat here some questions presented themselves to my mind. We sold that elevator because we could not afford to keep it. They tempted us with a price that was beyond its value. Why? Because you are getting crowded in Buffalo. There is no room to do the business, and when you make the price of the land upon which an elevator is built \$700,000 or \$800,000, I tell you that it is the people out on the prairie who have to pay for it.

"Now get that 20 miles of water front down there, where it is farm land today; and in place of the prices that are prevailing on Buffalo creek, and in this constricted situation, give us a chance. If not, it won't go to Buffalo. The land at Parry Sound is cheap. You can get it there, and they are glad to have it. And, depend upon what I say, you have nothing that comes before congress now, or this year, or next, or in any of the next five years, you have nothing that is anyway so important as this question of transportation. You have pounded transportation on the back, and on the head, and in every other way until everybody is frightened, and they do not know what they can do, and do not know what they dare do. You have got the lowest land transportation in the world, and your water transportation on the lakes is the lowest of its kind. But, you have got the country today where they cannot move their stuff. That is the proposition that is before congress today. What is to be done? Are they to sit down and burn it? They cannot move it within thirty days—the Lake Shore freight. Within three weeks they have had more than 30,000 cars under load between Chicago and in Chicago, and between Chicago and Rochester.

"Now a moment ago I had occasion to look up the number of miles of terminal track that existed in Buffalo 13 years ago, or 14 years ago. At that time there was about 1,700 miles of terminal track at Buffalo, in the city limits. I think I am quite safe in saying today they have got over 2,500 miles of track—terminal track—a mileage further than from Chicago to San Francisco; and this is not sufficient to handle the business. In the case of a new mill built in Buffalo—a very large one, built by one of the Minneapolis Washburn-Crosby people, they could not get their cars moved, and they bought their own engines, and still could not get their cars moved, because of this restriction, this want of facilities.

"You cannot do this great amount of business on land that is of a higher price than the corner on which you put a

fancy jewelry store, or a sewing machine agency. It will not do, because the cost of the land enters into the cost of using the land, or the use that is to be made of it afterwards. And, I tell you, you are going to put the business of the country—when I say you, I do not mean that you personally are going to do anything of the kind—but you will put the business of the country in the most unfortunate condition. It is already there today.

"The trunk lines north of the Chicago river and east of Chicago are perfectly helpless. They cannot move. They cannot move their local business, and their through business. What are we going to do? We are bringing lumber from Puget Sound. It goes to Buffalo, and is there distributed. Now it goes to every place between Jacksonville, Florida, and Portland, Maine—lumber and shingles—and that business has grown up within the last seven years—within six years. In 1897 we had about five trains a week from Puget Sound. Now we have four or five a day."

The Chairman. "That is, lumber?"

"Yes, sir; and that lumber goes to every state in the union east of the Rocky mountains, and south of the Ohio river. In many instances even so far south as Florida, because there are sticks there that you cannot get anywhere else. We bring it for 40 cents a hundred—1,000 miles—the lowest lumber rate in the world; and when it comes to the lakes it has to be put on the ships or vessels of some kind, and carried to the lower lake ports. Now, if it has got to unload on a dock that is worth \$500,000, the lumber can not pay it, and either the man who is making the lumber has got to get out of the market, or you who buy the lumber must pay the prices.

The Chairman. "What do you anticipate will be the growth, proportionately, of the shipment of grain from the head of Lake Superior eastward to the Atlantic seaboard by rail and by water?"

"If there was a 21-ft. channel—because that would allow you to draw 20 ft.—you could run ships carrying 10,000 tons—modern ships. There are a few that carry 7,000 now, but 5,000 is a high average of the modern ship. But now, if for the same wages you can move it at the same cost, or say at a 10 per cent. higher cost, if you can move two ship loads for but 10 per cent. more than the cost of one, the rate will come down. Excuse me if I speak plainly, but the great trouble has been the lack of judgment and the want of knowledge. We start in to overtake the present condition, and our country is growing so fast that we do nothing for the future; and the present conditions, by the time we have overtaken them, we find to be past conditions, and we find the procession already ahead of us, as it was when we started. If we could start with the point I mentioned just now, of getting a 10,000-ton ship, I think that the grain from Duluth, if you please, would go to tide water, to New York, or to any other good port, for 5 cents a hundred."

The Chairman. "What is about the cost from Duluth now?"

Mr. Hill. "It is 8½ or 9."

The Chairman. "Elevator charges and all?"

Mr. Hill. "About 10 cents, including elevator charges and insurance."

Mr. Sawyer. "What would it be a bushel?"

Mr. Hill. "About 8½ cents a bushel, and going up to nearly 10."

Mr. Sawyer. "That is not the canal rate?"

Mr. Hill. "That is the lake and canal rate. The canal rates are usually so much higher than the railroad rates that the railroads are carrying the grain."

The Chairman. "At 5 cents a bushel do you take into account?"

Mr. Hill. "I do not want to assume too much, and I think it would be reasonable to bring it to 5 cents. It is now between 9 and 10."

The Chairman. "Do you take into account the completion of the Erie canal?"

Mr. Hill. "There is not any place to do the business in Buffalo. I happen to know something that the Buffalo gentlemen here do not know. I happen to know how the Lackawanna \$50,000,000 plant went to Buffalo. One of my sons was a classmate of one of the sons of the old Scranton people, and he told them that it was a million and a half thrown away, in addition to the delay, and hauling the stuff down to Scranton and back again, and they figured it up, and they went to work and established a plant at Buffalo, and that all came about from the conversation between two boys, or between two young men. That is the result. You have not room to hang your hat, commercially speaking. And then we sold our elevator, and now the elevator stock, in some sort of an arrangement there, was 500 to 600. We did not want to go into it. We are not in the elevator business to make money, but to free it. When we built it they said, 'We will run you out.' We paid, I think, about \$400,000 for the land that we built the elevator on at Buffalo creek. It was a high price. But by and by after a day, with the thing running over time and getting down to half a cent, instead of one and a half cents, they said, 'We will give you so much.' They gave us \$180,000 profit on the cost of our plant. Now, nobody who has at heart the interest of the producer anywhere can afford to be in the business with a plant of that kind. A million and a half investment. The building itself cost \$750,000, or half of that money. Twenty thousand dollars is all the elevator ground ought to cost. The man who is raising that grain is paying a return on the investment of three-quarters of a million, and it is just as much of an obstruction as the rate of transportation, or anything else. And the same laws that govern transportation on the highways and on the high seas apply to the man who is moving the stuff on the road with a cart. This enormous business that has grown up in the country is so great that you cannot handle it. You have not anything to come before you this year, or next year, that will relieve as many people, and do as much good, and enlarge everything connected with that lake transportation, as this project, and if you will not do it, the people in the west will be strangled."

The Chairman. "One of the most perplexing questions before us is the development of river transportation by improving the rivers of the country. What do you say of the future of the river?"

Mr. Hill. "I am an old river man. My early experience was on the Mississippi river between St. Louis and St. Paul. I was agent, before I was 20 years old, of a steamboat line, and was connected with it before I went into railroading. A high-pressure boat, a boat that can navigate shallow water, is useless as a means of transportation. The money you are appropriating for all that you might just as well take it and throw it away. If a railway could be built between Buffalo and New York, and was not compelled to carry passengers at all, or run a passenger train, I would undertake with it to empty the boats on that thousand-ton barge canal."

The Chairman. "I do not quite understand."

Mr. Hill. "I would undertake to drive that canal into a lily pond. The man is not born who will say that with the largest amount of tonnage, and the proper facilities, and the opportunity to get rid of carrying passengers—I say the man is not born to say what a railroad cannot do."

The Chairman. "What do you say of deeper rivers, 9 or 10 feet?"

Mr. Hill. "If you could make from New Orleans to St. Louis a 24-ft. canal—"

The Chairman. "That is hardly practicable. What would you say of a 10 or 12-ft?"

Mr. Hill. "That won't do."

The Chairman. "What is your line of reasoning on that?"

Mr. Hill. "Because the railway will take the business from it sooner or later. Suppose I had \$100,000 to raise, and I had to raise it on 100,000 tons of freight. It would be a simple calculation. It would be a dollar a ton. And, if you gave me 200,000 tons of freight to move, it would be 50 cents a ton. And, if you gave me 400,000 tons of freight, the rate would be 25 cents a ton. And, if you will give me 2,000,000 tons, the deal has got down to 5 cents profit. Now it is the volume of the traffic. The rate of dividend does not change. That remains the same. The making of railway traffic is like developing a frontage tax. If you have 1,000 ft. of front to distribute it over, that fixes it. If you have 3,000 ft. it is a different rate, and so on."

The Chairman. "What would you say, Mr. Hill about—"

Mr. Hill. "I know this is unpopular. People say it will regulate the railway. That is, water transportation will have the effect of regulating the railway rates. But I do not know one place where that is so. I will give you a case in point: We own on one river all the steamboats that are there. We own it—the railway owns it. I would be delighted to sell them for the annual appropriation that is made for them. I think I would be willing to take half the annual appropriation."

The Chairman. "What would you say is the least depth of a river channel or canal which can be made profitable in competition with the great trunk lines of railways. You speak of 24 ft. from St. Louis down."

Mr. Hill. "I understand you. If the line of railway is intelligently built, it is just as important to have a low grade railway with capacity to haul a heavy load behind a locomotive, as it is to have a harbor bar dredged. It is just as important to haul 2,500 or 3,000 tons behind a locomotive, as that a ship can come in drawing 25 or 30 ft. of water. The water transportation is so little as compared with the land transportation, that I say if the railway is intelligently built, and closely worked out, it is hard to draw the line; and if you have many transfers, the railway will equal anything that is short of 20 feet."

The Chairman. "Is not this true, however, that there will be seasons when the most complete equipment of railways will be insufficient to handle the traffic? There will be congestion, and it is desirable to have river channels to relieve that?"

Mr. Hill. "The river town does not cut any figure. I am sorry to say, as an old river man, that it does not. It might be made from St. Louis to Cairo with a great expenditure of money. But concentrate that business on a well-built railway, and whether that railway wants to or not, give them all the business they can do—all they are intelligently designed and able to do—and you will get a much lower rate than if you had six railroads trying to live off the same business."

The Chairman. "What do you say as to the waterway parallel to the railway as a help, and each a stimulus to the other—the water to carry the heavy and gross freights, and the railway to carry light freights and passenger transportation?"

Mr. Hill. "There is no stimulation in it. There is a natural law lying at the bottom of it. The best located railway in the world is the one located on the water course, because the whole question of transportation is overcoming the law of gravitation; and because you have got alongside of that river, on the line of the least resistance, you are able, with a good railway, well constructed and intelligently handled, to just make that river drop the bundle anywhere you say so. That applies everywhere in the United States, and it always will apply. The longer this question is before the public, the more that feature of it will assert itself. The waterway, unless it is a 20-ft. waterway, where you can carry a great big load with little money—unless you can do that, you are

practically throwing the money away. As I said before, you might as well lath and plaster the river."

The Chairman. "We are much obliged to you, Mr. Hill."

Mr. Sawyer. "Mr. Chairman, Mr. William Livingstone will speak, and Mr. Goulder also. But just before that, I want two or three of our committee to talk about two and a half minutes apiece—Mr. Tomlinson of Duluth, and Mr. Gratwick of Buffalo, who is a vessel owner also, and Mr. William A. Rogers, president of the Tonawanda Iron & Steel Co. They are all practical men."

Mr. Hill. "I think, Mr. Chairman, that perhaps you may have had something in your mind as to my attitude here; and in sitting down and coming away from the question I was speaking about, it occurs to me that you might think that when I was saying that the railroad would overcome the water transportation I was favoring the railway, or something of that kind. I will give you a point. We have been transporting flour from Minneapolis to Hong Kong and Australia. The cost from Minneapolis to Hong Kong is 40 cents a hundred, 8,000. Figure it out. It is hauling 10 barrels of flour, a ton, 10 miles for a copper cent. It is 2,000 miles by railway, and the rest by 30-ft. ships—ships drawing 30 ft. of water. When you get down and use it for what it is worth, and give it the volume of traffic, and the facilities for doing it, as I said, nobody that I ever met can say what is the lowest limit. I beg your pardon, gentlemen, but I just wanted to clear that from the chairman's mind."

MR. WILLIAM A. ROGERS' ADDRESS.

Mr. William A. Rogers said: "I will undertake to make only one point and would like to emphasize both it and one which has already been mentioned by another. First—I would cite the conditions of Tonawanda's commerce as proving the fallacy of the statement that the requirements of commerce do not call for this work at the present time. That the commerce of the Tonawandas is worthy of your highest consideration is evidenced by the fact that next to New York and Buffalo they are the largest shipper by railroad of any city in the state. I have this statement on excellent authority. To this rail traffic is added a large volume via the Erie canal of such bulky freight as lumber and pig-iron, making the Twin Cities the most important port in the state after the two great ones mentioned. It has been shown to you that the evolution of ship-building on the great lakes has brought into existence vessels carrying from 5,000 to 8,000 gross tons of freight, which are now doing nearly all the business of the lakes and against which the smaller vessels cannot compete. The result is that for years none of the smaller class has been built. Each year sees a number of those in existence eliminated, through wreckage and other causes (fifty-two having been lost this last season) so that the number which can navigate the present Niagara river channel which limits ships to 14 ft. draught, is rapidly decreasing and will very soon be inadequate for its commerce. The large commercial interests of the Tonawandas look with dismay upon this menace to their lake trade, upon which the whole fabric of their industrial life is built. Indeed, Mr. Chairman, work begun at once on this improvement will scarcely keep pace with the extinction of the only class of vessel which can reach this port under existing conditions of navigation. This fact I would emphasize most earnestly as also the second—referred to by a previous speaker, that the expenditures you have made on Buffalo's harbor have attained their end and completely served their purpose. Every particle of land behind its breakwater has been taken up, industries have already expended millions there and millions more are to be expended in finishing the plans for developing that shore. The condition exists today that there is not a spot left on the Buffalo harbor where an industry requiring water frontage and a large adjacent land area could gain foothold. Surely the requirements of commerce call, not only for beginning this work now, but for pushing it with all possible dispatch."

INTERESTING STATISTICS BY MR. TOMLINSON.

Some very interesting statistics were given to the committee by Mr. George A. Tomlinson of Duluth who said:

"The lake shipments of grain from the port of Duluth-Superior for the season of 1903 was 53,000,000 bu. Fifteen per cent. of this grain was consigned to Canadian ports. Ten years ago only 5 per cent. of the grain shipped from Duluth went via Canadian ports, the ratio of increase being 1 per cent. annually. Ten years ago Fort William and Port Arthur, which are the lake ports of shipment for Canadian grain, consigned 95 per cent. of the crop to American ports. Last year only 65 per cent. of the shipments from Fort William and Port Arthur went to American ports. This decadence in the consignment of grain to American ports is largely due, in my judgment, to the superior lake terminal facilities offered by the Canadian ports on Georgian bay. During the last ten years the evolution in lake freight carriers has been most remarkable. In 1893 the vessels carrying 3,000 net tons were of the largest class. Today, a ship of 12,000 net tons is being constructed, and there are several carriers of 10,000 net tons capacity. The terminal facilities at Buffalo are so congested and inadequate—and Buffalo is the only American lower lake port of outlet of any magnitude—that a vessel of more than 5,500 tons carrying capacity cannot easily be accommodated in Buffalo harbor. The smaller ship is fast disappearing from the lakes. Today, the average capacity of vessels engaged in the ore and grain trade is 5,000 net tons, so that nearly 50 per cent. of grain and ore tonnage, now in operation, is not adapted to the facilities of the Buffalo harbor. Based upon last year's operating expenses, a vessel of the 3,000-ton type could carry a ton of grain from Duluth to Buffalo at a little less than 50 cents. A ship of the 5,500-ton type could perform this service at about 42 cents. A ship of the 7,000-ton type could do the work for about 38 cents, and of the 10,000-ton type for about 32 cents. As the farmer pays the cost of transportation of wheat moved from the Dakotas to the continent of Europe, his grain will be transported over the cheapest routes and broadly speaking, the cheapest route under the present conditions in Buffalo is via Canadian ports; since 50 per cent. of the American grain and ore carriers find it a hardship to discharge at the principal American lake grain terminal."

REMARKS BY MR. W. H. GRATWICK.

Mr. W. H. Gratwick of Buffalo said:

"Thirty years ago my father started in the vessel business in Buffalo, and at that time all the vessels were built to do business in Buffalo and land any cargoes wherever it might be desired. At the present time we have only full-sized boats, that will carry from 5,500 to 6,500 tons. The consequence is that the congestion of shipping is so great, and it is so difficult to get these boats to the docks, that we hardly ever have them at Buffalo any more. In the last year and a half—even the last year—we have been sending them there more than in the ten years before that, on account of the breakwater development that made it possible to send vessels to Stony Point, to the Lackawanna Steel Co. where the facilities are reasonable and up-to-date. The same condition would exist if the Black Rock development should be made. I simply wanted briefly to call attention to the fact that while the lake conditions and the conditions of the tonnage have grown in the last fifteen years enormously the facilities at Buffalo, with the exception of Stony Point development, have stood still."

MR. EDWIN A. BOND ON ERIE CANAL ENLARGEMENT.

Mr. Edwin A. Bond, state engineer and surveyor and chairman of the Erie canal advisory commission said that it would take from five to seven years to complete the enlargement of the Erie canal.

"How will you let this contract? In sections?" asked Mr. Burton.

"Yes, in sections."

"How many contracts?" asked Mr. Burton.

"Between the first of May and the first of June five con-

tracts, amounting to about \$5,000,000, will be let" replied Mr. Bond. "We limit for the first two years to \$10,000,000 expenditure; but that merely means to get the project under way. And I wish to state this in connection with the enterprise, that by recent study we find that by deepening the channel between Tonawanda and Lockport a depth of 4 2-3 ft, we can get a water supply from the Niagara at Tonawanda, and in that way we can do away with the old canal between Tonawanda and Buffalo, giving a stretch of 8 miles that can be utilized then for dock purposes for the upper lake traffic; and then, while it would probably call for another appropriation of \$1,000,000 from the state of New York, the state is so vitally interested in the improvement of the Erie canal that I feel confident it would expend another million for that purpose."

The Chairman. "What would be accomplished by that expenditure?"

Mr. Bond. "It would lower the stretch of the canal between Tonawanda and Lockport, which lies east of Tonawanda, allowing us to take the foot of the canal direct from the Niagara river at Tonawanda, and open up the 8-mile stretch that is now occupied by the present canal as a feeder and permit all that 8 miles being used for dock purposes for the commerce of the upper lakes."

The Chairman. "What depth of channel would you have for that section?"

Mr. Bond. "That would be abandoned as a canal, and kept up for dock purposes, as the requirements of the case called for; and that feature as such would shut it out from navigation so that by the expenditure of another million dollars we can take our foot from Tonawanda and open up eight miles on the main shore of the state of New York for dock purposes for the upper lake traffic."

The Chairman. "In some cases the embankment between the lake and canal would be taken out?"

Mr. Bond. "Yes, sir."

MR. JOHN CUNNEEN'S REMARKS.

Mr. John Cunneen, attorney general of New York state, said:

"Now, as I have sat here and listened to the gentlemen who are competent by experience to speak upon the subject and to point out the importance of this improvement, I have had a feeling of confidence growing upon me—a conviction rather—that this body of gentlemen who are members of this committee, who are dealing with these questions continually, and who have the responsibility of providing for and anticipating the demands of commerce and the needs of the people of the country, can not fail to be impressed with the importance of doing this work, and doing it now, not waiting until the big canal is completed—not waiting until the other contemplated improvements are completed in and around Buffalo, and not compelling them to stand still and not fulfil the measure of their usefulness until this improvement is made, but will realize that this improvement which is essential to the utility of the others should go on contemporaneously with them."

AN ADDRESS TO THE POINT BY WILLIAM A. LIVINGSTONE.

When it came to actual facts the speech of Mr. William Livingstone, president of the Lake Carriers' Association, was one of the very best.

"So much has already been said on this subject," he began, "and the subject has already been covered so thoroughly, that frankly, there is not a great deal more to be said. In my experience in appearing before this river and harbor committee in the past, with the great knowledge its chairman and members possess—and I am frank to say your chairman, gentlemen, is a perfect encyclopædia, so to speak, of everything pertaining to navigation throughout the length and breadth of the United States—I say I have come here from time to time and it seemed to me it was impossible to tell him anything he had not anticipated already."

The Chairman. "If that was so, it was only temporary, I assure you."

Mr. Livingstone. "Therefore a man naturally comes before this committee somewhat diffidently. But I just want to say a word to this committee upon what I consider the great national importance of this work. The local features of it the Buffalo people, of course, will take care of, and I know there has been a little disposition in some quarters to contend that it was to some extent a local interest. But so far as I can consistently do it, I would like to disabuse the minds of the committee on that point. This is something that the whole United States—that is, leading from the tidewater up to the great northwest and all the states contiguous to it—is very largely interested in. In fact the people in that section are very much more interested in it than those who carry on the transportation business by freight and water. I think Mr. Hill has demonstrated that to you clearly and satisfactorily. As a matter of fact, the great transportation problem of today is boiled down in one sentence, and that is the query, What will carry the largest amount of freight with the smallest amount of money? Mr. Tomlinson demonstrated what great advantage the large carrier had over the small carrier. I remember in 1881 the papers of that day had all this information, and it was sent out in the press dispatches, and contained an immense statement that the Sault canal in 1881 had carried 1,500,000 tons of freight. To be accurate, I think the amount was 1,607,000 tons. If you will take the ships, which Mr. Tomlinson has under construction today, five of those ships making the average number of trips a season, would carry that tonnage and nothing would be thought of it. There have been such tremendous changes in navigation. It has grown beyond the dreams, so to speak, of the greatest optimist who ever entered the business—that is, it is almost impossible for any man to predict where it may stop. I will just make one allusion here to the great reduction in the price of freight. I remember of as high as \$7 a ton being paid to transport ore from Lake Superior to Ohio ports. Of course the boats, you understand, at that time were very much smaller, and they would be absolutely useless now. But I tell this merely to show you the great progress that has taken place. I remember being caught with a boat in Marquette not many years ago, and I thought I was almost ruined because I had to take \$4.50 a ton. Yet the average for the past ten years has been in the neighborhood of about 86 cents a ton."

"I heard Mr. Hill say last night, speaking of the transportation question in a general conversation, that we have the lowest freights in the United States of any country in the world, and as an illustration of that he mentioned different countries. I speak now of rail freights. He mentioned freights starting as high as \$2.25 and coming down to Russia—"

Mr. Hill. "The lowest."

Mr. Livingstone. "Yes, which was the nearest to the United States; and the average there was \$1.75, whereas the average rate on our railways was 72 cents a ton."

Mr. Hill. "That is, 72 cents for hauling a ton 100 miles."

Mr. Livingstone. "Yes. As a matter of fact it is an utter impossibility for any one to contemplate now competing in the transportation business unless they are about to handle a reasonable amount of tonnage. The great difficulty is the lack of terminal facilities. That is the growing need today of the transportation problem. With all due deference, Mr. Chairman, to yourself and to the committee, for whom I have the greatest possible respect, you speak of the great many projects which you have on hand and of the projects which have been on hand for twenty years. With all due deference, Mr. Chairman, I say, I contend that there is no project in the transportation problem today that begins to equal, or can in any way approach, the problem of the transportation on the great lakes. In 1881, 1,500,000 tons passed through the Sault canal. It was only in 1894 that it passed the 10,000,000 ton mark, but in 1898 it passed the 20,000,000 ton mark, if my

memory serves me aright, and it has gone up now in the neighborhood of 37,000,000, and almost 40,000,000.

"I saw in a morning paper the other day that they were boasting that the commerce and tonnage was greater in London than in any port in existence, and you must remember they have 365 days in a year there, as against 230 days with us; and their tonnage was \$220,000,000, a trifle over one-half of what passes through the Sault canal. But a chain is only as strong as the weakest link in it. It makes no difference how many millions of dollars the government expends in the improvement of its waterways, providing we can not get into the harbors. If you can go into them with only 16 or 17 ft. you are limited to that capacity. Our needs have outgrown our harbor facilities. If there is any one thing that is of great importance to the great northwest—to all the consumers and producers both of the north and east—it is terminal facilities at Buffalo. It is the gateway, so to speak, the entrance point to the gate to tide-water.

"I will not point out here the enormous growth of trade across the border, but it is being demonstrated day by day and month by month that if we do not awake to the importance of the situation it is probable, and very probable indeed, that a great amount of the traffic that is now carried by American routes will be side-tracked and be carried by other routes.

"Mr. Sawyer made a side-remark here about the Panama canal—and a very apt remark indeed—that if we waited, perhaps we would not have the money to make these improvements with. I have no desire to cast reflections on the Panama canal; but, gentlemen, just as an illustration, I want simply to say this: It is estimated that the Panama canal when completed, outside the cost of \$40,000,000 to the Panama Canal Co. and \$10,000,000 to the republic of Panama, will cost about \$145,000,000 to finish; and then there are the engineering problems which defeated De Lesseps, and which will cost something over \$200,000,000. And yet, gentlemen, pretty much on the line of what Mr. Hill told you about the line of canal up at St. Paul, when that canal is completed, unless the tonnage is vastly near developed at different points than it is now, it will be a lapse of years before 10,000,000 tonnage go through that canal. The Suez canal, which operates 365 days in a year, carries less than one-third of the tonnage of the Sault canal.

"Understand, gentlemen, I am not making reflections on the Panama canal. I believe in the Panama canal. I believe the United States government can afford to pay for it. I remember when the whole nation with bated breath listened intently for some news from the battleship Oregon, when she was making her way around the world from San Francisco to Key West, and at that time the nation doubtless would have paid two or three times the cost of the Panama canal if they could have been assured of the absolute safety of the Oregon. And I remember the sigh of relief that went up from the people throughout the country when it was learned that she had arrived safely on the coast of Florida.

"But I contend that this improvement which we are asking at your hands is not a local matter but is very largely a national matter; and if you want to benefit this country at large, and do the greatest possible good to the greatest possible number, you have got to improve the terminal facilities. And if the great state of New York is willing to spend something heretofore unheard of in the history of the United States, or of any other country, to provide this great waterway, then for God's sake it does seem to me that this federal government can afford to expend \$4,000,000 or \$4,500,000 to give them the necessary facilities to use and enjoy the benefits of that canal, particularly from the fact that a very large proportion of that \$100,000,000 expenditure will benefit the States and people outside more than it will benefit the people of New York state.

"Speaking of the size of ships and their great growth, you talk about 10,000 tons. The older we get the more we find out, and the less we know; and I think it would be a bold man

nowadays who would stand here and attempt to predict what the limit of tonnage might be on the lakes. I remember that a couple of boats were built some 13 years ago which carried 3,000 tons, and some people thought then they were too large. We have gone forward by leaps and bounds until, as has been stated to you today by Mr. Tomlinson, here are boats going to run, of 10,000 to 12,000 tons. How can they do it without these terminal facilities? What would you think of the intelligence of Mr. Hill, gentlemen, if he built from the Lakes to the Pacific coast, to connect with the great ships which he has built for the Orient—what would you think if he should build a four or six track railway and right in the center of that line left a single track—one single track of line—and all these great feeders would have to transfer bulk there, so to speak, and be carried over that single line? It would be an imputation on his intelligence which few people would be able to realize. Of course it could not materialize with Mr. Hill, who everybody recognizes has been one of our nation's builders in the matter of progress and commerce.

"Speaking just for a moment relative to the twenty years which some of these projects have been on hand, I believe, as Mr. Burton, the chairman, said, take the great change that has occurred on the lakes in twenty years. There is not in the United States or out of it, so to speak, a development that begins to parallel it. I can say without contradiction there is not a single bill before congress today in the way of cheapening and improving transportation facilities—in fact you can not bring up a dozen cases all together that would equal in importance the single improvement that is here asked for, for the harbor of Buffalo.

"I merely want to emphasize one point, or hammer on the head of one nail; and that is the great importance of further terminal facilities. A very large amount of money that the government has appropriated for the deepening and widening of rivers and the improvement of navigation is to a very large extent nullified until we get the proper terminal facilities, so that the present vessels and ships can be utilized. Fifteen years ago a 2,000-ton ship was considered a large ship; and yet I say to you frankly that I would not take today a 2,000-ton ship as a gift, providing that one of the conditions or terms of that gift was that I should take that ship and keep her in condition and run her. I would be in just the same position as the courtier of the sultan of the Orient when the sultan wanted to ruin him, the sultan made him a gift of an elephant, and the courtier, being permitted neither to sell it or give it away, was ruined by the cost of its maintenance. That would be the shape or condition of any man who undertook to run a 2,000-ton steamer nowadays."

MR. GOULDER'S FORCEFUL TALK.

A very direct and forceful talk was made by Mr. Harvey D. Goulder, counsel for the Lake Carriers' Association, who said: "I want to say, both for Mr. Livingstone and for myself, that while he is president and I am counsel of the Lake Carriers' Association, we do not come here representing that association, but rather as individuals who, through our association with the lake carriers and our life-long association with the business on the lakes generally, are expected to know something about the conditions in it. I understand, too, that the question before this committee is not a question of the desirability of this improvement, but a question of selection from among a number of other projects. How desirable is it? We have here a report from a board—I do not know of whom composed, or how familiar with the particular subject its members were—but we have a record of an opinion by a board of engineers that the improvement of Black Rock harbor is not desirable to commence at the present time. That is this improvement which we are talking about. They made that report, saying also in it that this improvement would be a national waterway together with the barge canal, which was not an assured fact when they made their report.

"Now the canal is an assured fact. It has gone through by

such a positive and decided majority, and has the sanction of the people of New York to such an extent that there can be no manner of doubt or question but that it will go through. The argument was made by the opponents of that canal that the state of New York could not build it because of its great national importance. The only argument made against that canal was that it was not local, but that it was for the benefit of the whole country, and therefore New York state ought not to pay it. The advocates of the canal granted that this was largely true but New York did not want to give up her canal and New York wanted the benefit of this route; and New York believed, beginning with Buffalo and ending with the city of New York, that to have that great artery of commerce through the state was of so great an advantage that they could not wait, and would not wait, for the United States government, but would go ahead and make that improvement themselves.

"I want to recall that we are not here with a new project. The propriety of deepening the channel and making a deep channel into the waters of the Niagara river, so as to complete the lake system above Niagara falls, was adopted by the government in 1888; and you started in, in 1888, to make a channel through a lot of shoals and rocks and reefs, with a current running at places abnormal up to 5 miles an hour, and frequently up to 8 or 10 miles an hour, with these rapids at the head of the Niagara river. There was a good deal of opposition to that, on the ground that if you cut away that natural dam at the foot of Lake Erie, and your water, not emptying into the still pool, but going into the current and so over the falls, you would reduce your surface as you reduced your bottom. I am not an engineer, and I do not know whether that is right or wrong; but I do know that as they started out to make an 18-ft. channel there, last year, you could not employ a tug in Buffalo or tow a vessel down that river drawing more than 14 ft. of water, and then at 14 ft. the man who wanted to load to the full depth was required to take his own risk of grounding in that channel.

"Now as to the question of its being a local interest. Why is this any more local than the improvement of the Lime Kiln crossing? Mr. Rogers, for instance, is interested in a great steel plant below this barrier. There are tens of millions of dollars invested there. This report says the improvements made in Buffalo are well ahead of the requirements. The board is misinformed on that subject. The best information is that you either cannot get space at all in Buffalo, or if you do get it, you have, as Mr. Hill says, to pay \$750,000 for a site that ought to cost \$20,000 for the purposes for which it is used.

"Now let me show you the reason why there should be an improvement in the lake commerce. One thing I expected to hear one of the Buffalo men mention, and they did not—because they are either too proud or too modest to say it,—and that is, that the ships that come down to Buffalo in the fall of the year are sometimes required to lie there a week or ten days at a time. They come to anchor under the breakwater, on the request of the harbor master of Buffalo, that they do not come into that harbor because of its crowded and constricted condition inside. They lie out there and await their turn to get to the elevators. That is not an unusual condition in Buffalo. We want to carry the grain as far by lake as possible. All the lake people have gone in, and I have advocated in numerous speeches the improvement of the Erie canal, and Mr. Livingstone and others did the same thing. We want to have that connection for the general benefit of that through route, and we are doing everything we can to have the through route by the lakes, and between the northwest and the east and the seaboard, established. You might as well say we will not make any improvements along the lakes because a vessel owner may make some money incidentally out of that improvement. The vessel owner made more money before the improvements were made.

If you had not made the improvements, the land transportation charges would be cheaper than the water. All the time the price is going down. The average rate in the lakes is less than one mill per ton per mile.

"The largest single fact in our recent shipping returns is the increase of steel steamers on the great lakes, from 237,145 gross tons in 1893 to 940,923 gross tons in 1903. In 1901 they built on the seaboard sixteen ocean steel steamers, with a gross tonnage of 76,374. In 1902 they built sixteen ocean steel steamers with a gross tonnage of 95,105. And in 1903 they built eighteen ocean steel steamers with a gross tonnage of 101,471. Now we are building at the same rate on the lakes. In 1901 forty steel steamers were built for the great lakes with a gross tonnage of 139,102. In 1902 forty-one were built with a gross tonnage of 158,631, and in 1903 thirty-seven steel steamers were built for the lakes with a gross tonnage of 131,283. These figures do not include wooden steamers and schooners and brigs and barges, but merely steel steamers. When we come here we say this to you: We are putting our money in to do this business. We are doing a cheaper transportation business than can be done anywhere else in the world. It is done more cheaply than anywhere in the world. There is the big northwest back of the lakes. Depend upon it, there it is a question depending on whether or not a man, a farmer, gets cheap transportation, whether he will be able to pay the mortgage off his farm, or will have his mortgage foreclosed. It is a matter of vital interest to these people—the cheapness of transportation rates. In that vast region you have a population of one or two to a square mile.

Mr. Hill. "It is about two to a square mile, extending from the lakes to the Pacific coast."

Mr. Goulder. "Yes. All that great northwest country, settling so rapidly. In Canada they are talking about building three different canals. They are working over there, and we say, God speed them. There is plenty of business for all. The trouble is that we cannot get enough on this or on both sides of the boundary line to thoroughly accommodate the needs of transportation, which Mr. Hill justly says is a bigger question than the tariff, or a bigger question even than whether we have a democratic or a republican president, Mr. Chairman. It is the great question in this country. We are not saying to you, 'if you make an improvement there will be business?' That is not the idea. We are saying we have already the business. There is plenty of stuff to carry, and the business is growing so that a man does not dare to predicate how much it is going to grow. We find that whereas we can readily build a ship 400 ft. long as against 200 ft. as was the case a few years ago, we cannot build our docks that way. You have got to have some place for these ships to do business; and here at Buffalo and the Niagara river, at the place where the need was recognized fifteen or sixteen years ago, you started in to get an 18-ft. channel. Sixteen years ago—two years before Mr. Burton got through the survey for the channel on the lakes—you authorized 18-ft. at the head of Niagara river, in order to utilize that length in this chain of transportation. There it is today. You cannot get your 18 ft. You have been sixteen years at it, and you have not got 14 ft., and 18 ft. would not do now. In 1880 you would have said that 18 ft.—you would have said 20 ft.—or you would have said 22 ft. Now you will have it at a price possibly double what it was when you authorized it sixteen years ago, for the business necessities have multiplied almost three-fold in that time.

"And one other thought. To show the purpose is not entirely a selfish one to the lake interests, I would mention the fact that there is trouble all the time about railroad bridges crossing this swift water. If you had slack water navigation there, with a lock down below at the foot of Squaw island, it would not matter within proper bounds how many railroad bridges you had across that canal, and it would not matter

how many were continued across those rapids, because in slack water navigation, where the ship could go slowly and be controlled easily, it would not be an unreasonable obstruction of the navigation to have more or less bridges across a channel—as many as would ever be required in that locality.

"The state of New York is making improvements by which the property rights will be ceded to the government. Go on and authorize this improvement. You cannot appropriate for it until next year. It will be a couple of years before you can get it started. It will be five years before it can be completed. Then be ready, with the efficient board they have now—that will be ready in from five to seven years. When they built the Weitzel lock of Sault Ste. Marie they used a small lock, and before they got through they had to provide a big lock—the Poe. Before that was put in vessels had to wait thirty-six hours—a condition which was improved by the Canadians when they opened the locks on their side; and Gen. Poe told me he had projected that lock 800 ft. long and 100 ft. wide, to accommodate at one time four ships of the largest type that would ever be used on the lakes, and before water was ever turned into that lock we had ships so large that two together could not be locked through at one time. Wherever you look about on the improvements on the lakes you will find that same condition of things, namely, that we do not get started early enough. And when a board says you do not need today a certain thing for several years yet to come, I say from my experience that you should have begun several years ago."

STATEMENT FROM CAPT. J. J. H. BROWN.

The hearing was closed with a statement from Capt. J. J. H. Brown of Buffalo who said:

"Through your courtesy, we have consumed more time already, gentlemen, than we had expected to have granted us on this very important subject, and I will only ask leave to offer other supplemental testimony. But let me say a word in regard to the detention of vessels in Buffalo for want of terminal facilities. I know, of my own experience, it is an annually recurring trouble. Our harbor becomes congested because its capacity is insufficient. I have seen over sixty large ships at a time, grain laden, waiting to be unloaded. Now, as Mr. Goulder has stated, and as Mr. Hill has stated, lake transportation is the cheapest transportation in the world. Nevertheless, it is so cheap because the cargoes are handled quickly, and the vessels more expeditiously, sometimes in and out of port in the same day. The losses resulting from delays in unloading cargoes at Buffalo do not fall upon the vessel owners only. They have a tendency to put the freights up. The people who use the transportation facilities pay the cost. This proposed project does not meet with universal favor in our city because it is feared it will take the commerce past Buffalo. But we already have more commerce than we can handle in the present harbor of Buffalo. My chief purpose now, however, Mr. Chairman, is to invite the members of the committee on rivers and harbors to visit us next summer, and I will promise you, if you do that, you will be well entertained, and we will be very glad indeed to have you there as the guests of the Buffalo Chamber of Commerce."

Mr. Burton thanked Capt. Brown on behalf of the committee but feared that the great number of their investigations and inquiries would prevent them from accepting. An adjournment was then taken.

The Cunard Steamship Co.'s report for 1903 shows net earnings of \$1,359,830 and a dividend of 4 per cent was declared. The report explains that the company's interest in the New York and Boston trades is meeting increased competition of other lines and that the directors have found it necessary to withdraw from their agreements with those lines, in order to be free to protect the company's share of business in whatever way may be necessary.

AROUND THE GREAT LAKES.

The tug W. B. Castle owned by Capt. Robert Thomson of Port Huron, was badly burned at that place this week.

The passenger steamer Lincoln which sank at her moorings at Windsor about three weeks ago has been successfully floated.

The fuel dock operated by G. Herman & Sons, Toledo, has been secured by the Stanley B. Smith Co., who will operate it hereafter.

Walter Mervil, formerly mate of the freighter George L. Craig, has been appointed manager of the Detroit & Walkerville Ferry Co.

Utica is the name selected for the package freighter building at the Wyandotte yard of the Detroit Ship Building Co. for the Western Transit Co.

The United States lake survey office has issued a new edition in colors of coast chart No. 1 of Lake Erie. It can be procured from the Marine Review.

Vessels of the Pittsburg Steamship Co. are being placed for coal for the first trip and a number of them will run before the opening of navigation.

Navigation was opened between Cleveland and Detroit this week by the arrival in Cleveland of the steamer City of Detroit on Tuesday afternoon.

The Ashland mine at Ironwood, operated by the Cleveland-Cliffs Iron Co., has been temporarily closed. The present force at the Ashland is about 300 men.

The steamer R. W. England, building at the yard of the Great Lakes Engineering Works, Detroit, will be launched during the latter part of the present month.

The first vessel to load coal at Buffalo for upper lake ports this season was the steamer St. Paul. She loaded last Saturday at the Philadelphia and Reading trestle.

Capt. E. Jean of Tonawanda, who was master of the steamer Samuel Marshall last year, has bought the steamer Alcona and will convert her into a lumber carrier.

The Edward Hines Lumber Co., operating the largest fleet of lumber carriers out of Chicago, has notified its engineers that there will be no business before May 1.

The Craig Ship Building Co., Toledo, O., has just closed contract for the construction of a steam yacht for H. T. Wickes of Saginaw, Mich., at a cost of about \$65,000.

At Gilmore's yard, Toledo, last week a new dredge was launched for the Chicago & Great Lakes Dredge & Dock Co. The dredge is 110 ft. long, 24 ft. beam and 11 ft. deep.

The schooner Sandusky, which was partly burned at Tonawanda last season, has been rebuilt by her owner, Edward Prill, and will tow with the propeller C. H. Birkhead this season.

The Duluth harbor of the American Association of Masters and Pilots adopted a memorial in honor of the late Capt. Robert J. Smith, and caused it to be elaborately engraved and sent to his family.

The new wharf of the Baltimore & Ohio railroad at Lorain is practically finished. It is 704 ft. long and is to be used exclusively as a coal dock. The work was done by the Standard Contracting Co.

Car ferry Shenango No. 1, which burned near the Conneaut breakwater March 11, has been abandoned to the underwriters. Maj. Daniel C. Kingman, government engineer, has asked for bids for the removal of the wreck.

The schooner Meriden, a 1,000-ton lumber carrier, was sold last week by T. M. Ryan & Co. of Buffalo to H. M. Loud & Co. of Au Sable. The Meriden is at present at Toledo. She will be taken to Bay City as soon as navigation opens.

Chicago brokers have placed the steamers Capt. Thomas Wilson and Vega for corn to Buffalo at two cents. While the vessels will be loaded at once they will not be expected to move at the opening of navigation should labor conditions interfere.

When the package freighter now under construction at

Wyandotte is completed, and when work upon the City of Buffalo, which is being lengthened 42 ft., is finished, the Detroit Ship Building Co. will have cleaned up all the work under order.

Models of the concrete breakwater that is under construction at Marquette will be exhibited at the World's fair, St. Louis. The models are complete in every detail and were made under the supervision of Assistant United States Engineer Clarence Coleman.

As a result of a January freshet, considerable extra dredging will have to be done at the harbor of Lorain. Government engineers have taken soundings and find that while the freshet deposited considerable sediment in some quarters, it deepened the channel in others.

The entire fleet of the Lake Superior Consolidated Co. is being fitted out to carry ore from the Michipicoten district and it is announced that the fleet will run as usual during the coming season, notwithstanding the financial embarrassments of the parent company.

Both of the passenger steamers of the Cleveland & Buffalo line are now being fitted out at Detroit. The improvements on the City of Buffalo are fast nearing completion. Unusual efforts are to be made to make the service extremely popular during the coming season.

Mr. C. J. Smith, traffic manager of the Canada Atlantic Railway, has been appointed to succeed Mr. C. F. Gildersleeve, who has resigned as general manager of the Richelieu & Ontario Navigation Co. to become general manager of the Bay of Quinte Navigation Co.

While a large portion of the tonage in Buffalo harbor has been chartered for coal for the opening trip, it seems to be understood that there will not be many boats loaded immediately. It is said that coal men are not going to put their coal into boats until the labor situation is settled.

Business Agent Harvey Jester of the Marine Cooks and Stewards Association has resigned his position and sent all books and moneys to the headquarters of the association at Buffalo. He says that he could not attend to his duties in addition to his work as agent for the Seamen's union.

Mr. G. L. Douglass, Jr., of Duluth, the new manager of the Lake Transit Co., has chartered the steamer Russia to the Sault line for the season. It is reported that the other two steamers of the Lake Transit Co.'s fleet, the Scranton and the Lackawanna, are also likely to be chartered for the season.

Bids have been asked of a number of ship builders by J. W. Ellsworth & Co. for the construction of a car ferry capable of accommodating thirty railway cars. The particulars of the service are not at present obtainable, but it is understood that the ferry will run between terminals 40 miles apart and make a round trip per day.

Judge Seaman of Milwaukee has awarded Henry H. Schroeder and Charles H. Ellis \$248.40 upon a libel against 451,719 ft. of pine lumber which was loaded on the steamer Hilton and a barge in Green Bay coming from the mills of the Hines Lumber Co. The libel is for demurrage in the loading of the lumber.

The Grand Trunk car ferry Grand Haven was towed into Milwaukee Sunday afternoon by the Crosby Line steamer Naomi with one of its wheels wrenched from the propeller shaft and two plates of the other one broken by a collision with the piers as she was leaving Grand Haven and in a subsequent battle with the ice.

The tug Cascade which sank off Lorain as a result of the storm last January has been examined and found to be a complete wreck. Nothing is left of her but the machinery and the bottom of the hull upon which the machinery rested. The engine and boiler will be released by the Great Lakes Towing Co. and utilized in a new tug.

Following is a list of officers elected by the Lake Seamen's union: William Penje, general secretary, Chicago; Thomas A. Hanson, general treasurer, Chicago; Alfred Pearce, agent,

Milwaukee branch; George Hanson, agent, Buffalo branch; Fred Benson, agent, Ashtabula branch; William Shaw, agent, Cleveland branch; Andrew Haganey, agent, Toledo branch; Thomas Lester, agent, Tonawanda branch.

The steamer International has been sold by Dr. Benie to Hotton Bros. & Co., the consideration being \$6,000. It is the intention of the new owners to operate her between the Sault and the West Neebish, engaging in the freight and passenger business. It is estimated that the men employed on the Neebish improvement this year will reach 1,000, whose wants, of course, would make a considerable trade.

The Package Freight Handlers' union has entered into an agreement with the agents of the package line steamers for handling package freight at the port of Cleveland during the coming season. Last year's schedule of wages was adopted. The men will be paid 35 cents per hour for regular time and 40 cents per hour for overtime. Sunday work will be done only when it is absolutely necessary that it should be done. This is the first season contract that has been entered into with the package lines.

Senator Russell A. Alger and the Hon. Peter White of Marquette, Mich., called upon the British embassy in Washington last week and saw Ambassador Durand regarding the participation by England and Canada in the celebration at Sault Ste. Marie next year to commemorate the semi-centennial anniversary of the opening of the first canal to commerce. It is hoped to make this celebration international in character, as Canada is quite as much interested as the United States in this waterway.

J. T. Daily, president, and S. B. Whittaker, superintendent of the Daily Towing Co. of New York, visited Buffalo this week for the purpose of purchasing the tug Major Kingman owned by Theodore E. Knight. The Kingman, however, was recently chartered by the Imperial Limestone Co., and consequently could not be sold. Messrs. Daily and Whittaker also desire estimates for furnishing an engine and boiler for a tow boat. The Daily company does a general towing business in New York harbor.

Judge Hazel of Buffalo has just handed down a decision in the case of the McArthur Bros. Co. and of Peter McArthur against lumber owned by Montgomery Bros. & Co. of Buffalo. The decision gives damages to the plaintiff in each case. The contention of the plaintiffs was that they had been subjected to loss on account of delays in loading and unloading. Judge Hazel held that the delay in loading was the fault of the vessels, but that the Montgomery Bros. should have unloaded the boats more expeditiously. He therefore awarded to the vessels the amount of two and a half days lost time.

Mr. Harry Coulby, president and general manager of the Pittsburg Steamship Co., made the following announcement last week: This company has accepted the resignations of the following gentlemen: J. F. Hayes, chief engineer; W. E. Gaynor, purchasing agent; J. W. Wolvin, assistant to vice president. With appointments recently made, the organization will stand as follows: L. W. Powell, vice president, Duluth; C. E. Scheide, treasurer, New York; Geo. D. Swift, assistant treasurer, Duluth; J. H. Hoyt, secretary, Cleveland; W. M. Jeffery, auditor, Duluth; A. F. Harvey, assistant general manager, Cleveland; E. C. Collins, traffic manager, Cleveland; W. W. Smith, superintendent, Cleveland; W. W. Watterson, assistant superintendent, Cleveland; F. B. Smith, chief engineer, Cleveland; Louis Hausheer, Jr., stores manager, Cleveland; E. H. Houghton, agent, Duluth.

Attorney General Knox has held that the coastwise trade of the United States does not extend to Guam. The question was asked by the Western Commercial Co. of San Francisco as to whether a British vessel could carry cargo without forfeiture from San Francisco to Guam. The attorney general holds that it can do so, and the commissioner of navigation has so announced it.

INSPECTION OF STEAM VESSELS.

Senator Frye has introduced a bill in the United States senate making certain important amendments to the statutes now regulating the inspection of steam vessels. The amendments are to sections 4405, 4411, 4412, 4426, 4430, 4472, 4481, 4488, 4489, 4490 and 4491 of the present statutes. The purpose of the amendments is to introduce greater elasticity into the act governing the inspection of steam vessels, and to abolish the present system of compensating the inspectors for their services. At present regulations can only be made by the concurrent action of the secretary of the department of commerce and labor and the board of supervising inspectors, which meets only once a year. The amendment provides that the board shall meet in Washington once a year and at such other times as the secretary may prescribe. The board shall recommend to the secretary of commerce and labor all necessary regulations and the secretary may amend such recommendations or add further regulations thereto in his discretion. He is also given the power to amend and appeal from time to time any or all of the regulations.

The present system provides that each inspector shall be paid according to the number of vessels that he inspects. For instance, if he inspects 100 steamers or less a year, he has \$1,200; 100 to 150, \$1,500; 150 to 200, \$1,800; 200 to 300, \$2,000; 300 to 500, \$2,250; over 500, \$2,500. The result has been that inspectors have in some cases given their chief attention to the mere matter of getting vessels to submit to inspection, regardless of whether such inspection was properly made or whether their other duties were properly attended to. This in itself is objectionable. Furthermore there is said to be a treasury order in existence, and certainly the practice is based upon the theory of such an order, by which these salaries are based upon the number of vessels passed and certificated. The vice of this system is, of course, obvious. It puts a premium on lax inspection. The proposed change does not materially alter the individual salaries. It merely groups them in districts into six classes, according to the salary received during the last fiscal year, and provides that hereafter inspectors shall receive a fixed salary dependent upon the district in which they work. The local inspector at New York is to receive \$2,500; the local inspectors of Philadelphia, Baltimore, San Francisco, Puget Sound, Boston, Buffalo, New Orleans, \$2,250; the local inspectors for Milwaukee, Duluth, Providence, Albany, Cleveland and Norfolk, Va., \$2,000; the local inspectors of Oswego, N. Y., New London, Conn., Willamette, Ore., Detroit, Chicago, Mobile, St. Louis, Port Huron and Portland, Me., \$1,800; the local inspectors of Pittsburg, New Haven, Conn., Savannah, Ga., Charleston, S. C., Superior, Dubuque and Toledo, \$1,500; the local inspectors of Bangor, Me., Galveston, Tex., Apalachicola, Fla., Evansville, Ind., Louisville, Ky., Memphis, Tenn., Nashville, Tenn., Cincinnati, Gallipolis, Wheeling, W. Va., Burlington, Vt., and Jacksonville, Fla., \$1,200. The section regulating the method of appointing local inspectors was held to be at variance with the subsequent civil service act and was declared void by the attorney general to such extent. The proposed change merely strikes out the part held invalid and now reads as follows: "The inspector of hulls shall be a person of good character and suitable qualifications and attainments to perform the service required of an inspector of hulls, who, from his practical knowledge of ship building and navigation and the uses of steam in navigation is fully competent to make a reliable estimate of strength, seaworthiness and other qualifications of the hulls of vessels and their equipment, deemed essential to safety of life in their navigation; and the inspector of boilers shall be a person of good character and suitable qualifications and attainments to perform the services required of the inspector of boilers, who from his knowledge and experience of the duties of an engineer employed in navigating vessels by steam, and also of the construction and use of boilers and machinery and appurtenances therewith connected,

is able to form a reliable opinion of the strength, form, workmanship and suitableness of boilers and machinery, to be employed without hazard of life from imperfection in the material, workmanship or arrangement of any part of such apparatus for steaming. The inspector of hulls and the inspector of boilers designated by the secretary of commerce and labor shall, from the date of designation, constitute a board of local inspectors."

A number of other amendments are incorporated in the bill so that hereafter minor details may be covered by regulations instead of by statutes. The statutes at present make detailed requirements as to certain mechanical appliances in such manner that the advance of mechanical invention is greatly hampered. The proposed changes are on the theory that the statute law should only prescribe the general requirements, leaving the details as to measurement, size, form and condition to be adjusted by regulation from time to time as the state of mechanical art may require. The great trouble in the past has been that the really unnecessary rigidity of the statutes has greatly hampered manufacturers, especially boiler makers. At present all safety devices on vessels down to the number of buckets are prescribed by statute and the board favors making this a matter of regulations in order that new inventions may be taken advantage of. It is also proposed to abolish the requirement compelling local and supervising inspectors to give bonds. This provision was made at a time when a fee was charged by the inspectors for each inspection made, and the bond was intended to cover the proper transmission of such moneys in the hands of inspectors. Since fees have been abolished, the government records show that the average sum of money which comes into the hands of the inspectors annually is only \$5, and it is, therefore, a hardship to compel them to pay premium upon bonds. Of course, the bill is likely to undergo a great deal of discussion before it is enacted into law.

CONTRACT WITH PILE DRIVERS AND WORKERS.

President D. J. Keefe of the Longshoremen's association and the officials of the Pile Drivers & Dock Workers' union have entered into an agreement with contractors at the port of Cleveland for the season. The conditions are practically the same as have been entered into by the officials of the Longshoremen's association, and are briefly these: Ten hours to constitute a day's work; pile driver foreman to receive 35 cents an hour; pile driver engineers to receive 30 cents an hour; laddermen to receive 22½ cents an hour; other laborers to receive 20 cents an hour; dock carpenter foreman will be paid at the rate of 32½ cents an hour and dock carpenters will receive 27½ cents an hour. Overtime is to be paid at the rate of time and a half for the time actually employed. Double time is to be paid for Sundays and legal holidays.

NOMINATIONS OF MARITIME ASSOCIATION.

The nominating committee of the Maritime Association has presented the following names of members to be voted for to fill the offices of the association for the ensuing year, at the annual meeting, to be held on April 26: For president, Chas. B. Parsons; for treasurer, Chas. R. Norman; for directors, George S. Dearborn, William D. Dickey, Samuel Gottheil, G. B. Lockhart, Fields S. Pendleton, J. Raymond Smith; for inspectors of election, E. Morse Bounington, Henry F. Miller, Eugene A. Perine, Henry A. Sweet; for auditing committee, Abiel Abbot, George T. Hay, Louis T. Romaine.

The United States Steel Corporation, which cancelled last year its coal contract with Pittsburg Coal Co. on account of a refusal by the Pittsburg company to reduce prices, has resumed relations with the company and contracted for a year's supply. The renewal of the contract is said to have been brought about by Mr. H. C. Frick.

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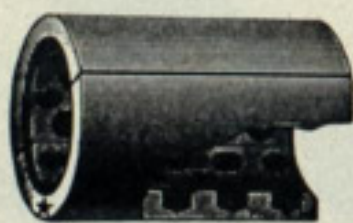
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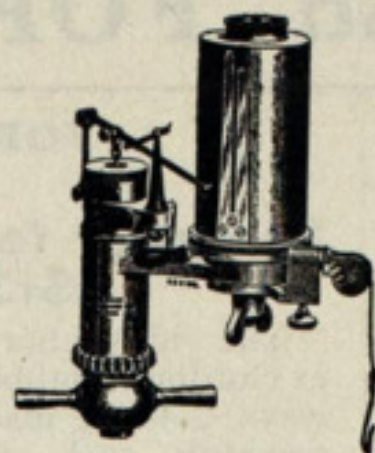
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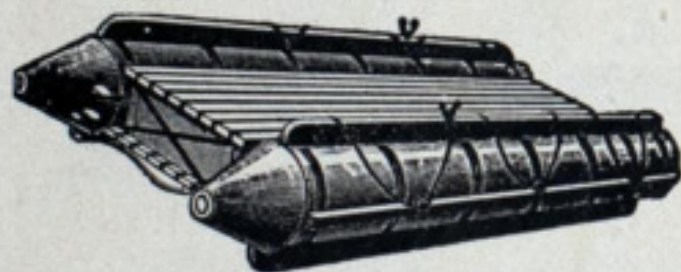
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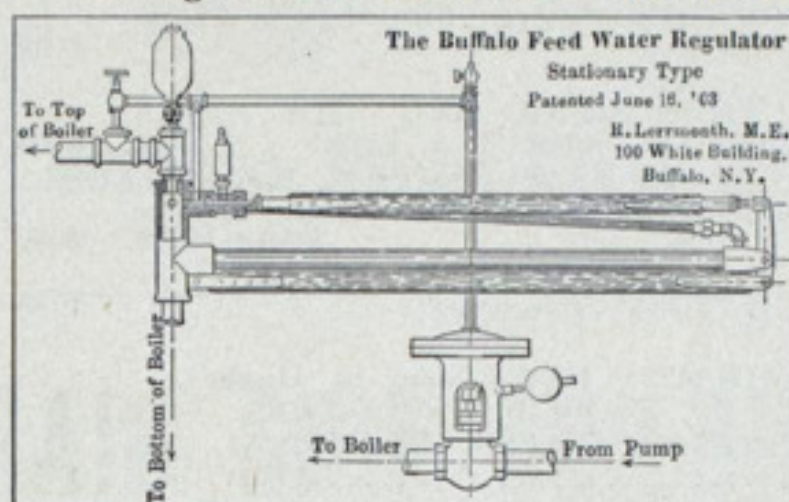


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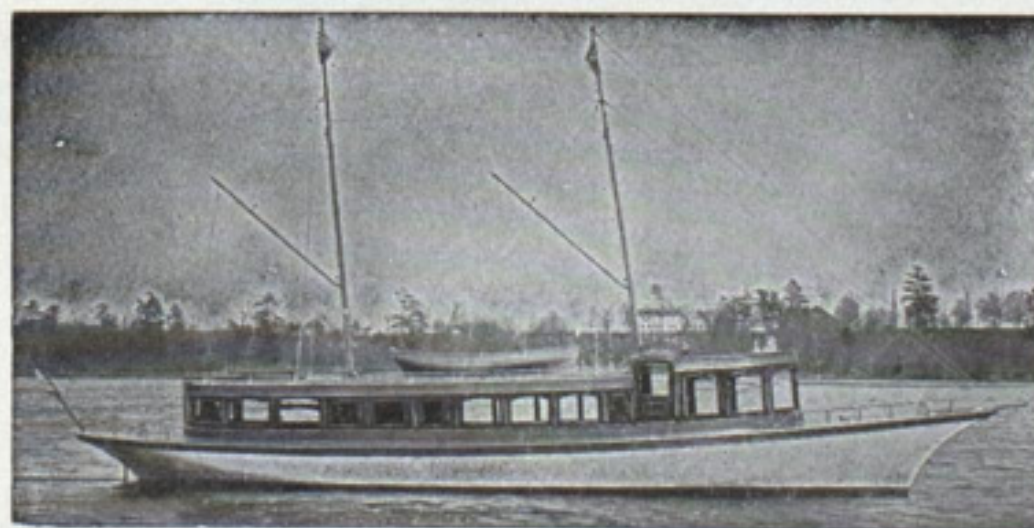
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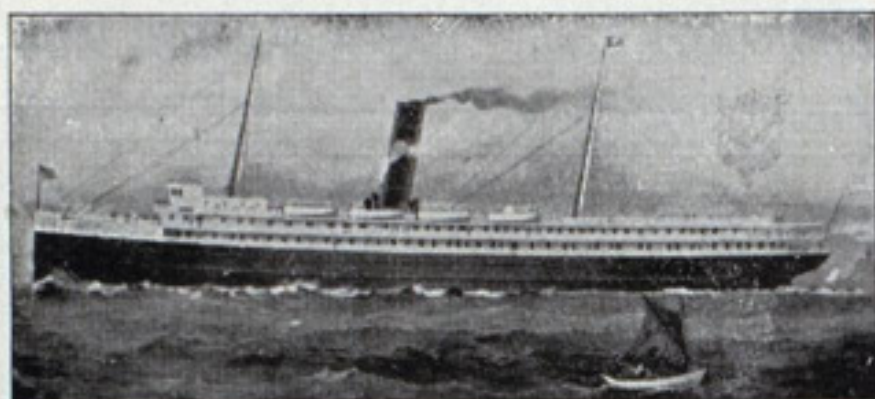
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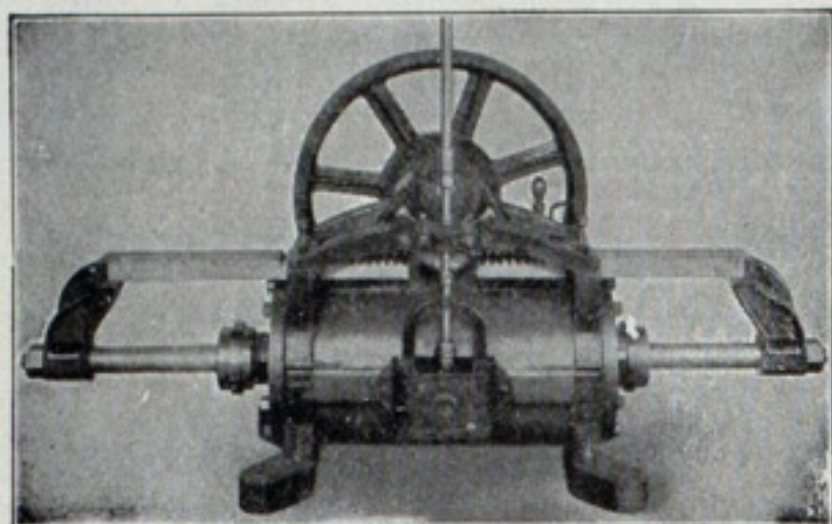
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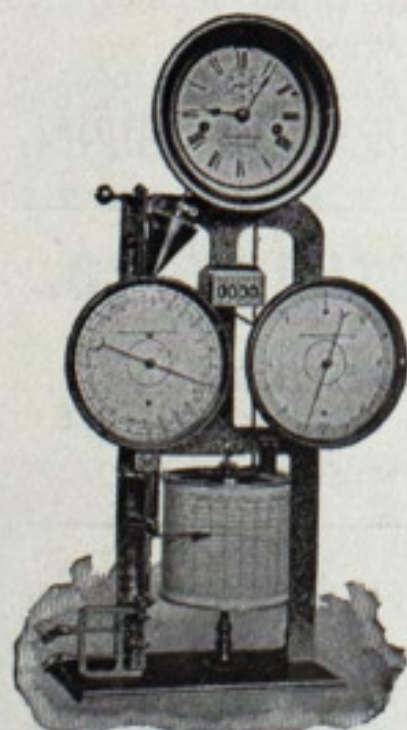
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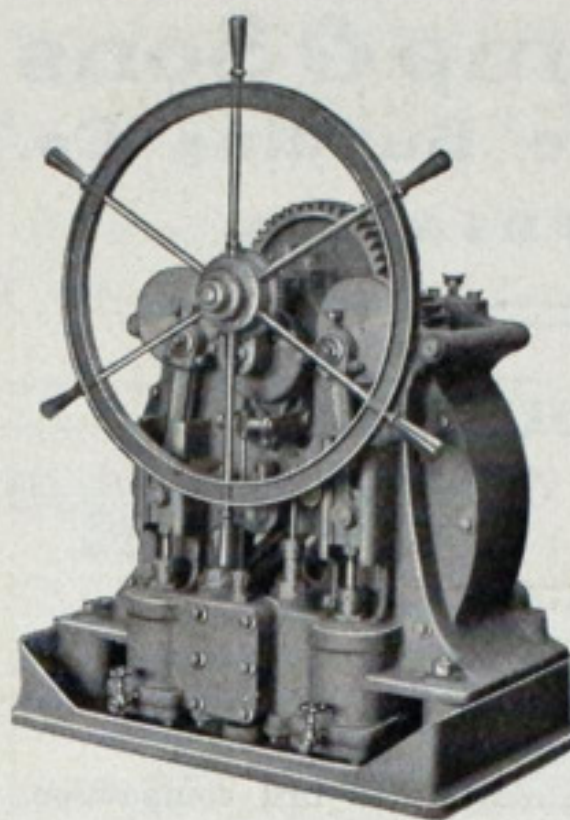
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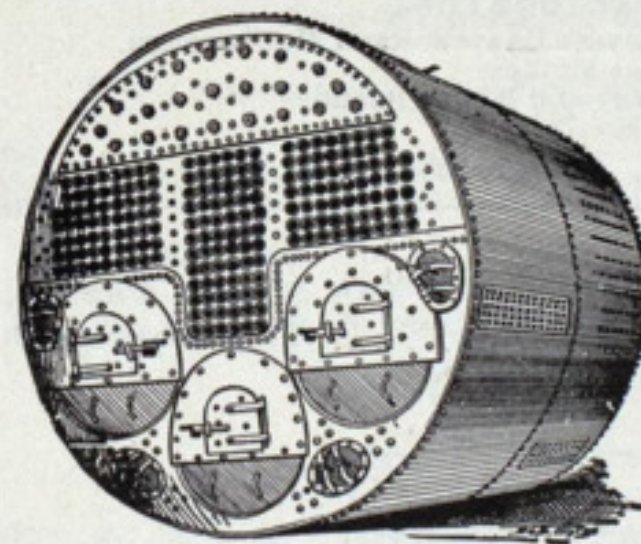
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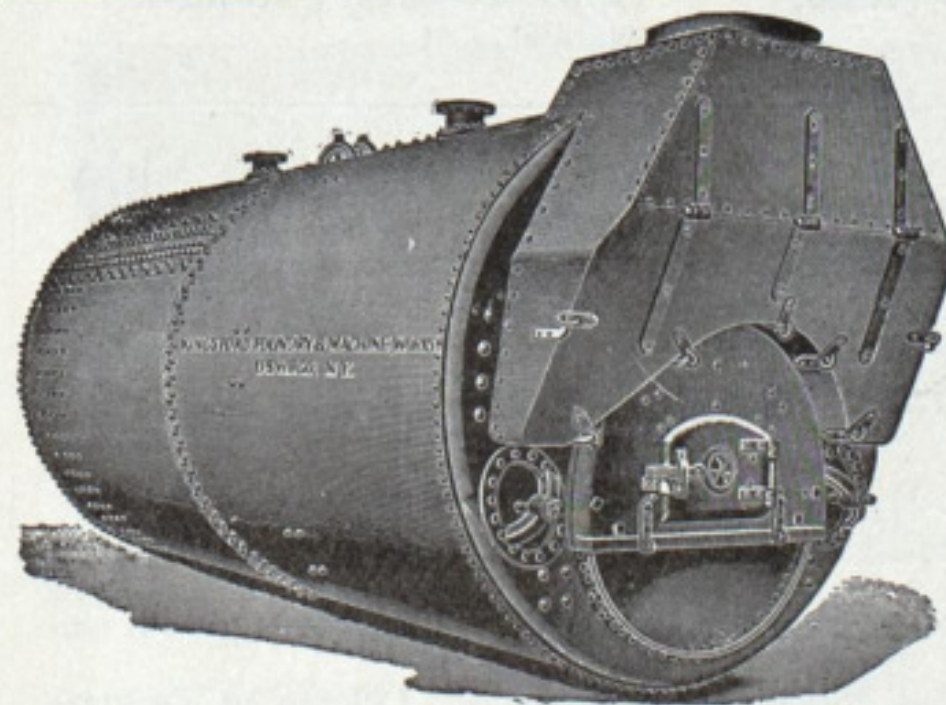
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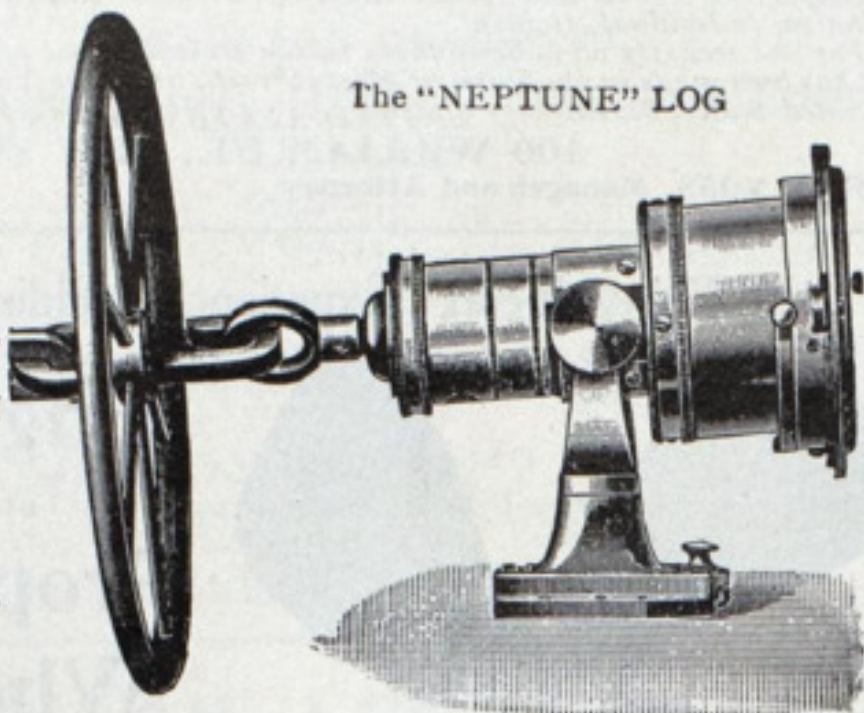
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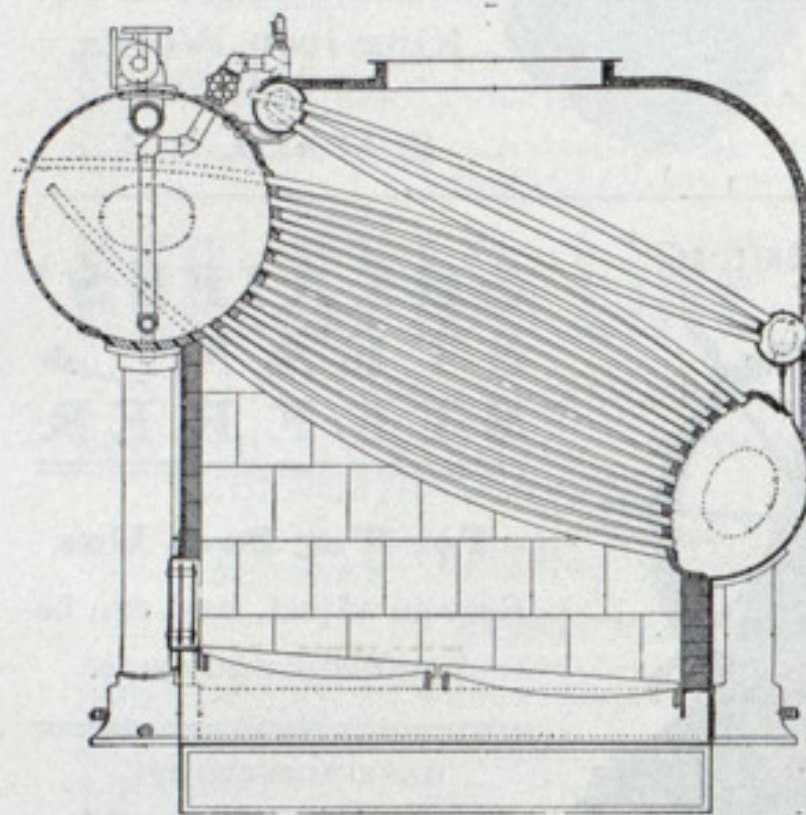
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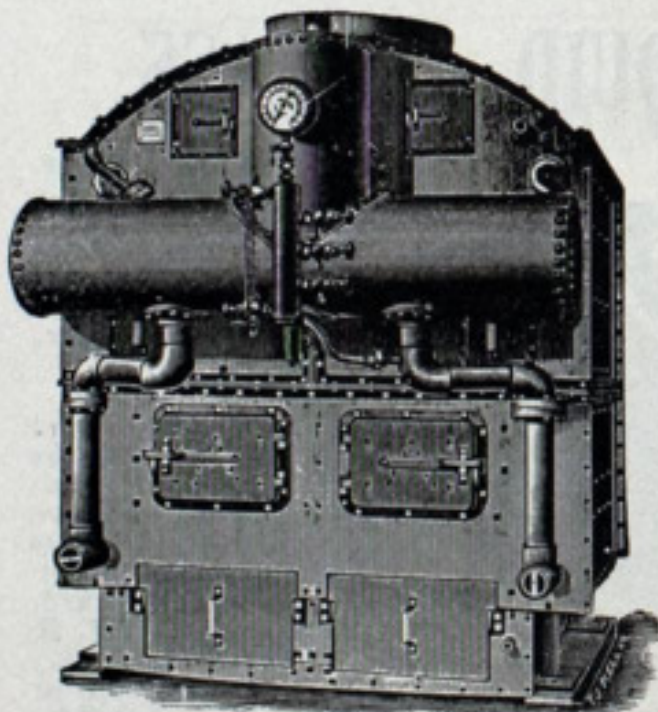


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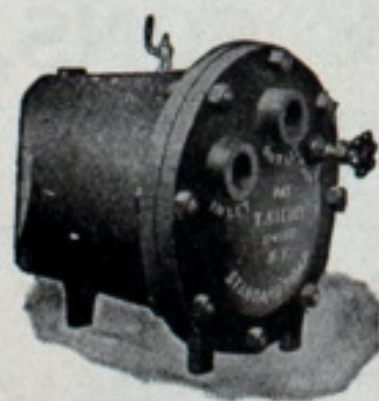
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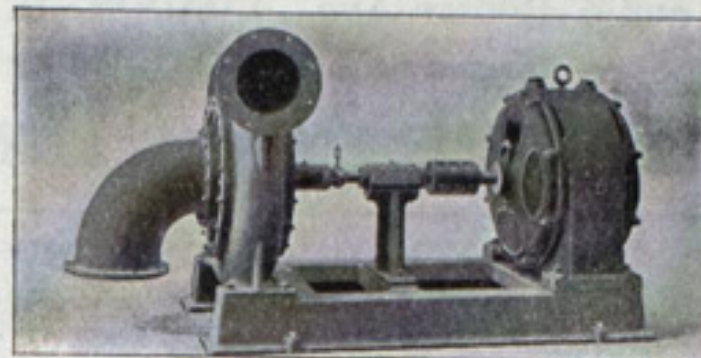
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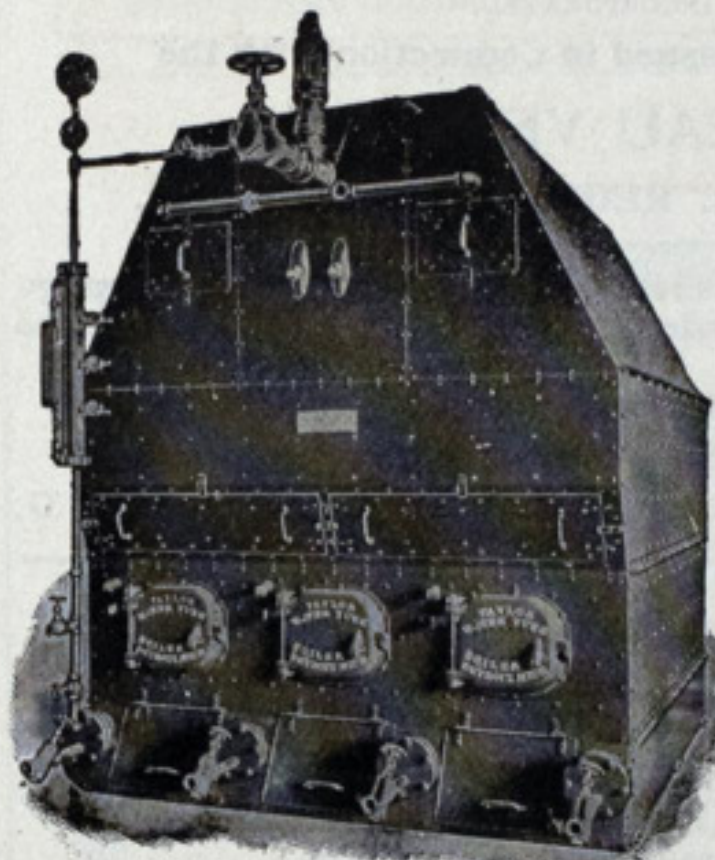
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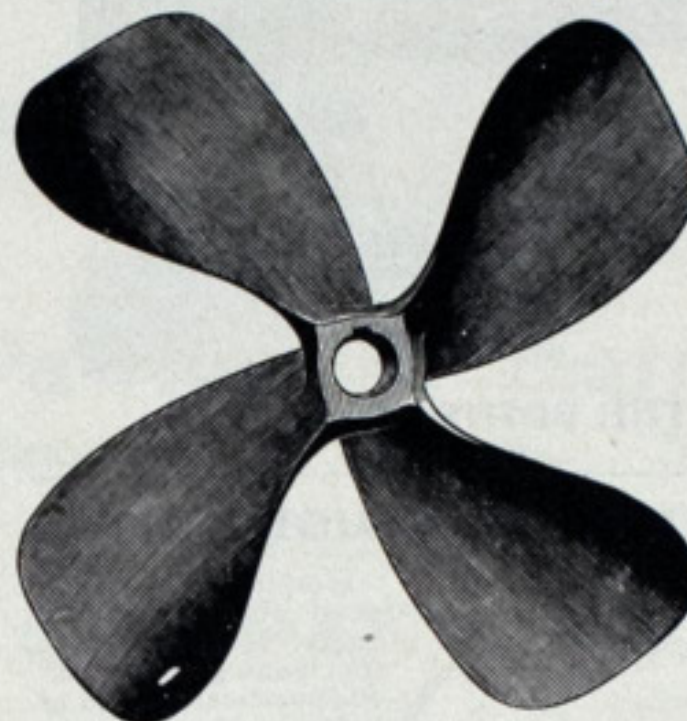
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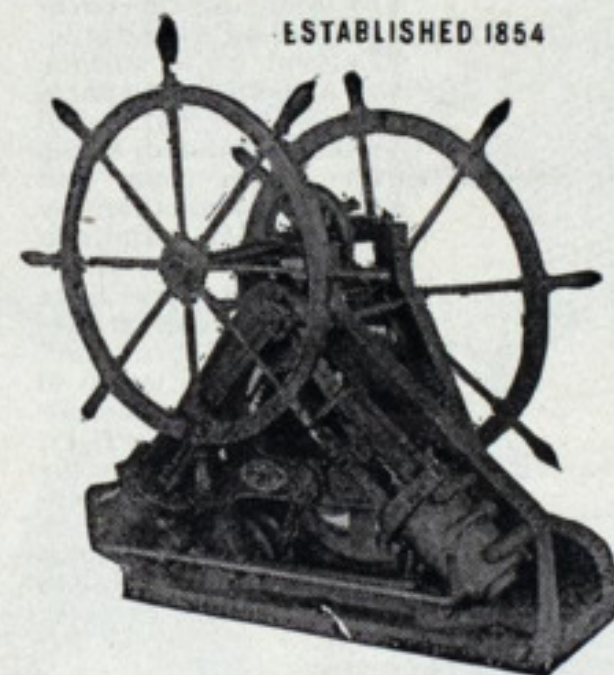
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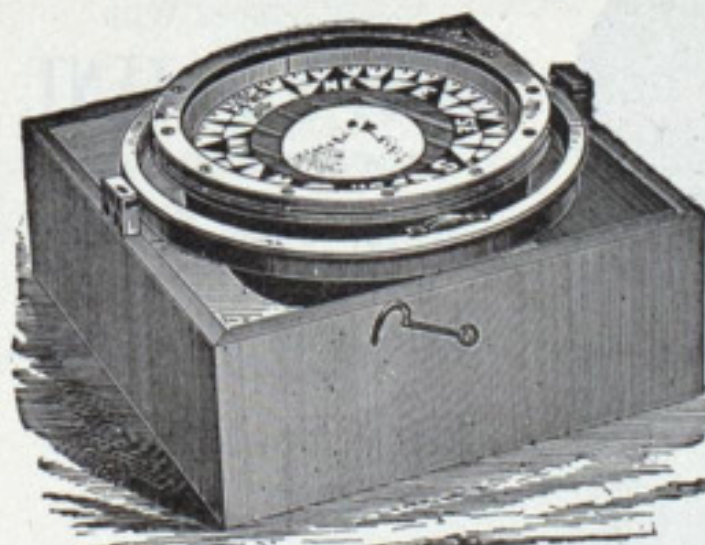
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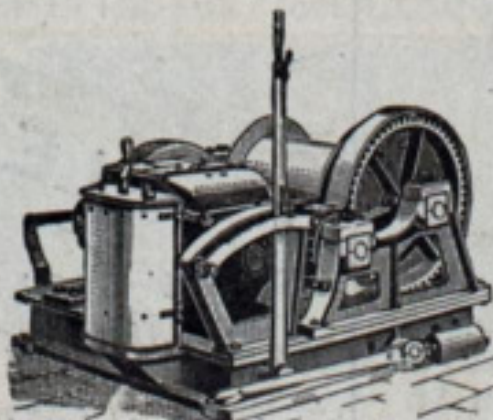
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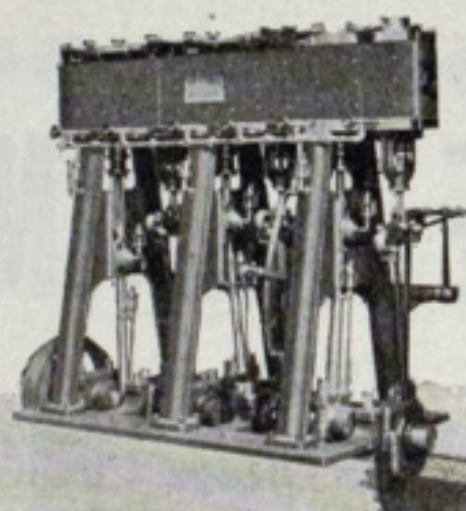
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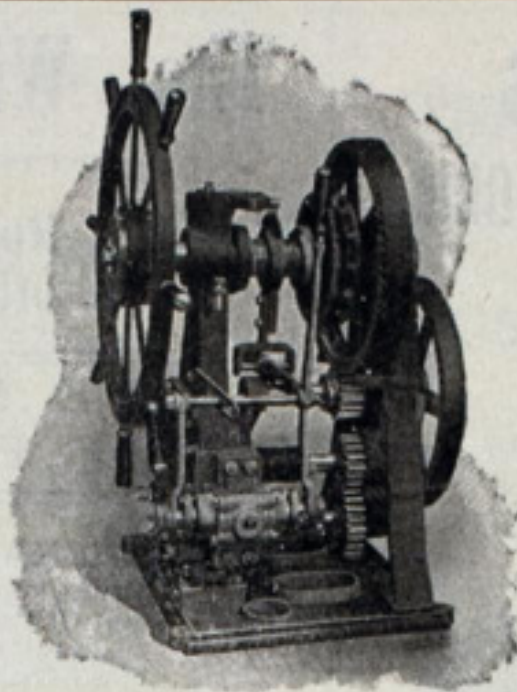
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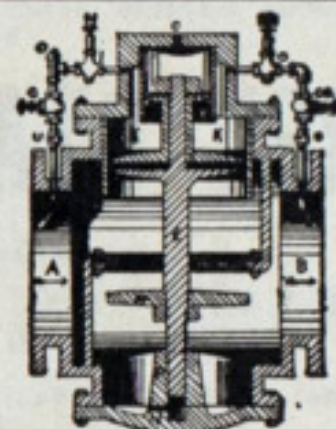
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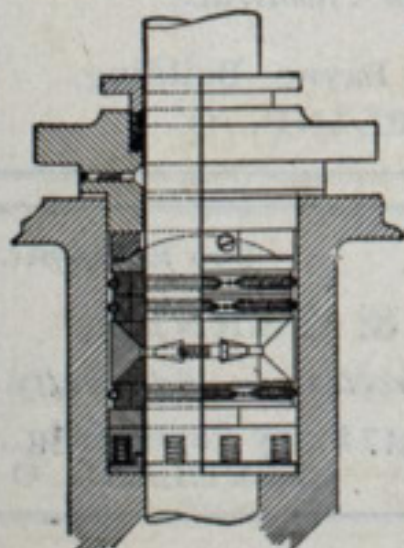
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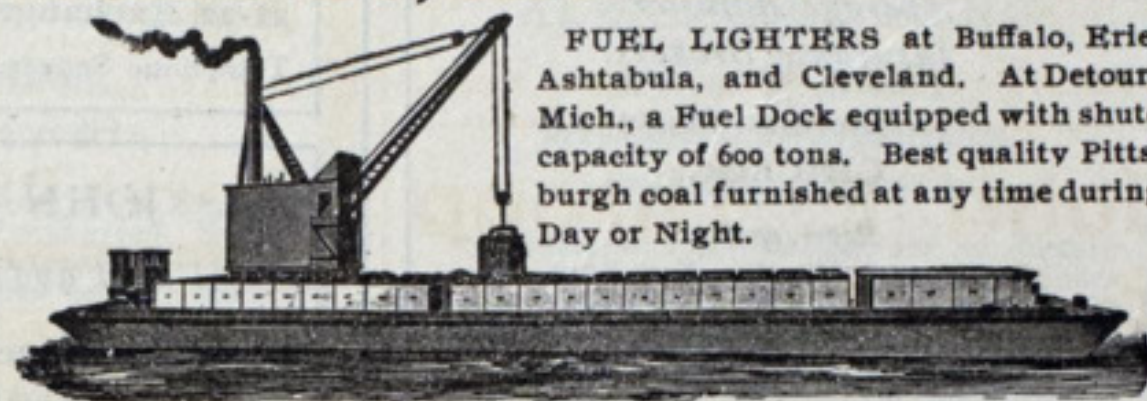
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See accompanying index of Advertisers for full addresses of concerns in this directory.

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LIGHTS, SIDE AND SIGNAL.

Russell & Watson.....Buffalo.

LOGS.

Nicholson Ship Log Co.....Cleveland.
 Walker & Sons, Thomas.....Birmingham, Eng.
 Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

LUBRICATORS.

Crane Co.....Chicago.
 Lunkenheimer Co.....Cincinnati.

LUMBER.

Martin-Barriss Co.....Cleveland.
 Shurick, F. S.....New York.

MACHINISTS.

Chase Machine Co.....Cleveland.
 Gogebic Steam Boiler Works.....Duluth, Minn.
 Lockwood Mfg. Co.....East Boston, Mass.
 Macbeth Iron Co.....Cleveland.
 Mooers & Co., H.....Milwaukee.
 Union Machine & Boiler Co.....Cleveland.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I.....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.
 Meckes John.....Cleveland.
 Siegel Cooper Co.....New York.
 Sterling & Welch Co.....Cleveland.
 Williams & Rodgers Co.,.....Cleveland.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
 Detroit Ship Building Co.....Detroit.
 Great Lakes Engineering Works.....Detroit.
 Sturtevant, B. F. Co.....Boston.

METALLIC PACKING.

Katzenstein, L. & Co.....New York.
 U. S. Metallic Packing Co.....Philadelphia.

METAL POLISH.

Bertram's Oil Polish Co.....Boston.

MOTORS, GENERATORS—ELECTRIC.

General Electric Co.....Schenectady, N. Y.
 Sturtevant, B. F. Co.....Boston.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

NAUTICAL INSTRUMENTS.

Ritchie, E. S. & Sons.....Brookline, Mass.

Buyers' Directory of the Marine Trade.—Continued.

NAVAL ARCHITECTS.

Hynd, AlexanderCleveland.
 Kidd, JosephDuluth, Minn.
 Lovejoy, H. O.Buffalo.
 Matteson & DrakePhiladelphia.
 Mosher, Chas. D.New York.
 Nacey, JamesCleveland.
 Rice, HenryBuffalo.
 Sadler, Perkins & Field.....New York.
 Steel, AdamCleveland.
 Wood, W. J.Chicago.

OAKUM.

DeGrauw, Aymar & Co.....New York.
 Stratford Oakum CoJersey City, N. J.

OIL FOR PAINTING.

Sipe & Co., James B.....Allegheny, Pa.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph.....Jersey City, N. J.
 Standard Oil Co.....Cleveland

PACKING.

American Steam Packing Co.....Boston.
 Crane Co.Chicago.
 Jenkins Bros.New York.
 Katzenstein, L. & Co.....New York.
 New York Belting & Packing Co.....New York.
 United States Metallic Packing Co....Philadelphia

PAINTS.

Baker, Howard H. & Co.....Buffalo.
 Detroit Varnish Co.....Detroit.
 Detroit White Lead Works.....Detroit.
 Forest City Paint and Varnish CoCleveland.
 New Jersey Zinc Co.....New York.
 Sipe & Co., James B.....Allegheny, Pa.
 Upson-Walton Co.Cleveland

PATENT ATTORNEYS.

Thurston & BatesCleveland

PATTERN SHOP MACHINERY.

Atlantic Works, Inc.....Philadelphia

PILE DRIVING AND SUBMARINE WORK.

Buffalo Dredging CoBuffalo.
 Chicago & Gt. Lakes Dredge & Dock Co...Chicago.
 Dupbar & Sullivan Dredging Co.....Buffalo.
 Fitz-Simon & Connell Co.....Chicago.
 Smith Co., L. P. & J. A.....Cleveland.
 Starke Dredge & Dock Co., C. H.....Milwaukee.

PIPE, WROUGHT IRON.

Bourne-Fuller Co.....Cleveland.
 Crane Co.Chicago.
 Macbeth Iron Co.Cleveland

PLANING MILL MACHINERY.

Atlantic Works, Inc.....Philadelphia

PLATES—SHIP, STRUCTURAL, ETC.

Bourne-Fuller Co.Cleveland.
 Otis Steel CoCleveland.

PLUMBING, MARINE.

Sands, Alfred B. & Son.....New York

PNEUMATIC TOOLS.

Allen, John F.....New York.

POLISH FOR METALS.

Bertram's Oil Polish Co.....Boston.

PRESSURE REGULATORS.

Kieley & MuellerNew York.
 Ross Valve Co.....Troy, N. Y.

PROPELLER WHEELS.

American Ship Building Co.....Cleveland.
 Atlantic WorksEast Boston, Mass.
 Cramp, Wm. & Sons.....Philadelphia.
 Detroit Ship Building Co.....Detroit.
 Fore River Ship & Engine Co.....Quincy, Mass.
 Great Lakes Engineering Works.....Detroit.
 Hyde Windlass Co.....Bath, Me.
 Jenks Ship Building Co.....Port Huron, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Macbeth Iron Co.....Cleveland.
 Milwaukee Dry Dock Co.....Milwaukee.
 Newport News Ship Building Co.....Newport News, Va.
 Phosphor Bronze Smelting Co., Ltd.....Philadelphia.
 Risdon Iron WorksSan Francisco.
 Roelker, H. B.....New York.
 Sheriffs Mfg. Co.....Milwaukee.
 Superior Shipbuilding Co.....Superior, Wis.
 Thropp & Sons Co., J. E.....Trenton, N. J.
 Trout, H. G.....Buffalo.
 United States Ship Building Co.....New York.

PROJECTORS, ELECTRIC.

Bogue, Chas. J.New York.
 General Electric Co.....Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F., Mfg. Co.....New York.
 Great Lakes Engineering Works.....Detroit.
 Kingsford Foundry & Machine Wks...Oswego, N. Y.
 Temple Pump Co.....Chicago.

PUNCHES, RIVETERS, SHEARS.

Allen, John F.....New York.

RANGES.

Russell & WatsonBuffalo.
 Siegel Cooper Co.....New York.

REFRIGERATING APPARATUS.

Great Lakes Engineering Works.....Detroit.
 Roelker, H. B.....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes RegisterCleveland.
 Record of American & Foreign Shipping..New York.

REPAIRS—ENGINE AND BOILER.

(See also Boiler Manufacturers and Engine Builders.)
 Gogebic Steam Boiler Works.....Duluth, Minn.
 Marine Iron Co.....Duluth, Minn.
 Forest City Boiler Co.....Cleveland.

RIVETING MACHINES.

Allen, John F.....New York.

RIVETS, STEEL, FOR SHIPS AND BOILERS.

Bourne-Fuller Co.....Cleveland.

SAFETY VALVES.

American Steam Gauge Co.....Boston.
 Ashton Valve Co.....Boston.
 Crane Co.Chicago.
 Hayden Mfg. Co., N. L.....Columbus, O.
 Lunkenheimer Co.Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co.....Buffalo.
 Upson-Walton Co.....Cleveland.
 Wilson & SilsbyBoston.

SALVAGE COMPANIES.

See Wrecking Companies.

SEARCH LIGHTS.

Bogue, Chas. J.New York.
 General Electric Co.....Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co.....Cleveland.
 Otis Steel Co.....Cleveland.

SHIP BUILDERS.

American Ship Building Co.....Cleveland.
 Atlantic WorksEast Boston, Mass.
 Buffalo Dry Dock Co.....Buffalo.
 Cramp, Wm. & Sons.....Philadelphia.
 Craig Ship Building Co.....Toledo, O.
 Chicago Ship Building Co.....Chicago.
 Detroit Ship Building Co.....Detroit.
 Fore River Ship & Engine Co.....Quincy, Mass.
 Great Lakes Engineering Works.....Detroit.
 Jenks Ship Building Co.....Port Huron, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Manitowoc Dry Dock Co.....Manitowoc, Wis.
 Milwaukee Dry Dock Co.....Milwaukee.
 Newport News Ship Building Co.....Newport News, Va.
 Risdon Iron WorksSan Francisco.
 Roach's Ship Yard.....Chester, Pa.
 Shipowner's Dry Dock Co.....Chicago.
 Smith & Son, AbramAlgonac, Mich.
 United States Ship Building Co.....New York.
 Willard, Chas. P. & Co.....Chicago.

SHIP CHANDLERS.

Baker, Howard H. & Co.....Buffalo.
 Marine Mfg. & Supply Co.....New York.
 Upson-Walton Co.....Cleveland.

SHIP LANTERNS AND LAMPS.

Russell & WatsonBuffalo.

SHIP TIMBER.

Martin-Barriss Co.Cleveland.
 Shurick, F. S.....New York.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLTS, IRON OR STEEL, HOLLOW, OR, SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

STEAM VESSELS FOR SALE.

Elwell, Jas. W. & Co.....New York.
 Gilchrist & Co., C. P.....Cleveland.
 Holmes, SamuelNew York.
 McCarthy, T. R.....Montreal, Can.
 Weeks, F. H.....New York.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line.....New York.
 International Mercantile Marine Co....Philadelphia.
 Pere Marquette R. R. & S. S. Line.....Milwaukee.
 Red Star LineNew York.

STEEL CASTINGS.

Macbeth Iron Co.....Cleveland.
 Otis Steel Co.....Cleveland.
 Seaboard Steel Casting Co.....Chester, Pa.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
 Chase Machine Co.....Cleveland.
 Dake Engine Co.....Grand Haven, Mich.
 Detroit Ship Building Co.....Detroit.
 Hyde Windlass Co.....Bath, Me.
 Jenks Ship Building Co.....Port Huron, Mich.
 Marine Mfg. & Supply Co.....Cleveland.
 Moulton Steering Engine Co.....New York.
 Pawling & HarnischfegerMilwaukee.
 Sheriffs Mfg. Co.Milwaukee.

STOCKS, BONDS, SECURITIES.

Fahey & Co.....Cleveland.

SUBMARINE DIVING APPARATUS.

Morse & Son, A. J.....Boston.
 Schrader's Son, A.....New York.

SURVEYORS, MARINE.

Gaskin, EdwardBuffalo.
 Hynd, AlexanderCleveland.
 Lovejoy, H. O.Buffalo.
 Matteson & DrakePhiladelphia.
 Nacey, JamesCleveland.
 Rice, HenryBuffalo.
 Steel, AdamCleveland.
 Wood, W. J.....Chicago.

TESTS OF MATERIALS.

Hunt, Robert W. & Co.....Chicago.
 Pittsburg Testing Laboratory Ltd.....Pittsburg.

TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co.....New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F.....New York.
 Watson-Stillman Co.New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.
 Chase Machine Co.....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
 Midland Towing & Wrecking Co., Ltd.Midland, Ont.

TRAPS, STEAM.

Kieley & MuellerNew York.
 Lunkenheimer Co.Cincinnati.
 Sturtevant Co., B. F., Jamaica Plain.....Boston.

Buyers' Directory of the Marine Trade.—Continued.

TRUCKS.		VESSEL AND FREIGHT AGENTS.		WHISTLES, STEAM.	
Boston & Lockport Block Co.	Boston.	Boland, John J.	Buffalo.	American Steam Gauge Co.	Boston.
TUBING, SEAMLESS.		Brown & Co.	Buffalo.	Ashton Valve Co.	Boston.
Shelby Steel Tube Co.	Pittsburg, Pa.	Elwell, Jas. W. & Co.	New York.	Lunkenheimer Co.	Cincinnati.
VALVES, STEAM SPECIALTIES, ETC.		Elphicke, C. W. & Co.	Chicago.	WINDLASSES.	
American Steam Gauge Co.	Boston.	Fleming & Co., P. H.	Chicago.	American Ship Windlass Co.	Providence, R. I.
Ashton Valve Co.	Boston.	Gilchrist & Co., C. P.	Cleveland.	American Ship Building Co.	Cleveland.
Crane Co.	Chicago.	Hall & Root	Buffalo.	Hyde Windlass Co.	Bath, Me.
Jenkins Bros.	New York.	Helm & Co., D. T.	Duluth.	Jenks Ship Building Co.	Port Huron, Mich.
Kieley & Mueller	New York.	Hawgood & Co., W. A.	Cleveland.	Marine Mfg. & Supply Co.	New York.
Lunkenheimer Co.	Cincinnati.	Holmes, Samuel	New York.	WINCHES.	
Moors & Co., H.	Milwaukee.	Hutchinson & Co.	Cleveland.	American Ship Windlass Co.	Providence, R. I.
Ross Valve Co.	Troy, N. Y.	McCarthy, T. R.	Montreal.	Hyde Windlass Co.	Bath, Me.
VALVES FOR WATER AND GAS.		Mitchell & Co.	Cleveland.	WOOD WORKING MACHINERY.	
Ross Valve Co.	Troy, N. Y.	Prindiville & Co.	Chicago.	Atlantic Works, Inc.	Philadelphia.
VARNISHES.		Richardson, W. C.	Cleveland.	WRECKING AND SALVAGE COMPANIES.	
Detroit Varnish Co.	Detroit.	Sullivan, D. & Co.	Chicago.	Donnelly Salvage & Wrecking Co.	Kingston, Ont.
Detroit White Lead Works.	Detroit.	Weeks, F. H.	New York.	Midland Towing & Wrecking Co., Ltd.	Midland, Ont.
Forest City Paint & Varnish Co.	Cleveland.	WATER GAUGES.		YACHT AND BOAT BUILDERS.	
New Jersey Zinc Co.	New York.	Bonner & Co., Wm. T.	Boston.	Dreln, Thos. & Son.	Wilmington, Del.
Also Ship Chandlers.		Lunkenheimer Co.	Cincinnati, O.	Lane & DeGroot.	Long Island City, N. Y.
VENTILATING APPARATUS FOR SHIPS.		VESSEL FURNISHINGS.		Marine Construction & Dry Dock Co.	New York.
Sturtevant, B. F. Co.	Boston.	Meckes, John	Cleveland.	Truscott Boat Mfg. Co.	St. Joseph, Mich.
		Siegel Cooper Co.	New York.	Willard, Chas. P. & Co.	Chicago.
		Sterling & Welch Co.	Cleveland.	YAWLS.	
		Williams & Rodgers Co.	Cleveland.	Dreln, Thos. & Son.	Wilmington, Del.
		WIRE ROPE AND WIRE ROPE FITTINGS.		Lane & DeGroot.	Long Island City, N. Y.
		Baker, H. H. & Co.	Buffalo.		
		DeGrauw, Aymar & Co.	New York.		
		Upson-Walton Co.	Cleveland.		

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The dagger (†) indicates that advertisement appears once a month.

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American Injector Co.	13	Falls Hollow Staybolt Co.	47	MacDonald, Ray G.	48	Sands, Alfred B. & Son	46
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*Boston & Lockport Block Co.	37	Great Lakes Register	44			Standard Chain Co.	45
Bourne-Fuller Co.	14	Hall & Root	48			*Standard Oil Co.	9
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Brown & Co.	48	Helm & Co., D. T.	48			Sterling & Welch Co.	45
Brown Hoisting Machinery Co., Inc.	2	Holmes, Samuel	48			Stirling Co.	8
Buffalo Dredging Co.	54	Hoyt, Dustin & Kelley	48			Stratford Oakum Co., Geo.	45
Buffalo Dry Dock Co.	10	Hunt, Robert W. & Co.	49			Sturtevant, B. F. Co.	56
Chase Machine Co.	12	Hutchinson & Co.	48			Sullivan & Co.	48
*Chelsea Clock Co.	3	Hyde Windlass Co.	56			Superior Ship Building Co.	40
Chicago & Gt. L. Dredge & Dock Co.	54	Hynd, Alexander	49			Taylor Water-Tube Boiler Co.	43
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*Contractors' Supply & Equipment Co.	3	Jenks Ship Building Co.	11			Trout, H. G.	44
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*Craig Ship Building Co.	38	Katzenstein, L. & Co.	47			Union Machine & Boiler Co.	47
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DeGrauw, Aymar & Co.	47	Lane & DeGroot	40			*Watson-Stillman Co.	55
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THE L. P. & J. A. SMITH CO.

CONTRACTORS FOR PUBLIC WORKS

Dredging,
Harbor Work,
Pile Driving,
Breakwaters,

Dry Docks and
Pier Building,
Railroads,
Canals,

Bridges,
Submarine
Foundations,
Etc., Etc.

Offices : Williamson Bldg., - Cleveland, O.

Dunbar & Sullivan Dredging Company, of Buffalo, N. Y.

Will contract to remove ROCK or EARTH on the Great Lakes to 40 ft. depth.
To remove ROCK on Atlantic coast to 40 ft. depth.

That's All.

Dredges.
Brian Boru, Steel.
Tipperary Boy, Steel.
Erin Go Braugh.

Drill Boats.
Geo. A. Howells and
another, both Steel.

Tugs.
Shaughraun, Steel.
Phil Sheridan, Steel.
Spalpeen, Steel.
Paddy Miles, Steel.
Shaun Rhue, Steel.

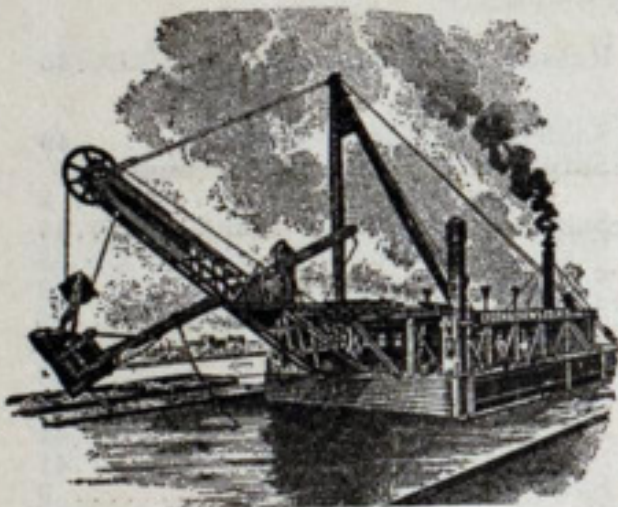
We SOMETIMES
rent plant to respons-
ible parties at OUR
terms.

Derrick.
Faugh a Ballaugh.
Small Scows.

Scows.

Monroe Doctrine, 600 yds., Steel.
Protective Policy, 500 yds., Steel.
Reciprocity, 600 yds., Steel.
Cuba Libre, 250 yds., Steel.
Gold Standard, 250 yds., Steel.
No. 5, 600
No. 6, 600
No. 7, 600
No. 8, 600

McMyler derrick handling 10 tons at
75 ft. radius.



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GRIFFITH, McDERMOTT & WATT DREDGING CO.,

CONTRACTORS FOR

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MAIN OFFICE, 1319-1322 CHAMBER OF COMMERCE,
CHICAGO.

THE FITZ-SIMONS & CONNELL COMPANY,

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Dredging,
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Canal Street, West of First Avenue,

MILWAUKEE, WIS.

BUFFALO DREDGING CO.

GENERAL CONTRACTORS ON SUBMARINE WORK.

Office D. S. MORGAN BLDG.

BUFFALO, N. Y.

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Alva.
Angeline, Hold. (Size 10x18—Price \$1.50).
Angeline, Spar Dock. (Size 10x18—Price \$1.50).
Argyle. (Thousand Islands).
Argyle. (Thousand Islands).
James Battle. (Detroit Fire Boat). On the ways.
James Battle. (Detroit Fire Boat). The launch.
Castalin.
Chicora.
Chippawa.
City of Bangor.
City of Erie at Buffalo Docks.
City of Erie.
Columbia. (On the Ways—Three Views).
Columbia.
Conemaugh.
Coralla, loading at Escanaba Ore Dock. (Size
17x21—Price \$2.00).
Corsica.
Corona.
John Craig.
M. M. Drake.
Eastern States. (Launch).
Eastern States on First Trip. (Three Views—
Broadside, Bow and Stern).
Eastern States. (On the Ways—Three Views).
Isaac L. Ellwood.
Excelsior. (Detroit Ferry).
Fairbairn.
H. C. Frick.
Garland. (Detroit Ferry).
Glidden—Wreck of, in St. Clair Ship Canal.
Greyhound.
Harlem.
Harvard. (On the Ways).
Harvard. (The Launch).
Harvard. (In the Slip—Two Views).
Helena.
Hennepin.
Holley, Alexander (Whaleback tow-barge).
Islander. (Thousand Islands—Two Views).
Frank E. Kirby at Put-in-Bay.
Lackawanna.
Mahoning.
Mahoning.
Majestic (Three views).
Michigan Central in Detroit River. (Winter).
Mohawk.
Montana.
W. B. Morley, wreck in Detroit River, Aug. 6, 1899.
Simon J. Murphy. (On the Ways).
Simon J. Murphy. (On the Ways—Two Views).
Simon J. Murphy, Launch. (Bow in Slip, Stern not
yet in Water).
Neshoto.
New Island Wanderer. (Thousand Islands).
New York. (Thousand Islands—Two Views).
North King. (Thousand Islands).
North Land, in the "Soo" Locks. (Two Views).
North Land, at Mackinac Island. (Two Views).
North Land and North West in Winter Quarters.
North West.
Onglara. (Two Views).
Peerless, at Mackinac Island.
Pere Marquette No. 17.
Plankinton at Northwestern Coal Docks, Duluth.
Pleasure, at Dock (Detroit Ferry).
E. C. Pope.
Princeton.
Ramapo.
W. D. Rees.
Rensselaer.
Rube Richards, in Ship Canal at Duluth.
St. Lawrence (Thousand Islands).
Ste. Marie, in Mackinac Straits.
Howard L. Shaw. (On the Ways—Three Views).
Howard L. Shaw. (The Launch).
Howard L. Shaw. (In the Slip).
Sir William Siemens.
George Stone.
Tashmoo. (In Dewey Naval Parade, Detroit River).
Tashmoo, June 9, 1900.
Tashmoo. (Entering St. Clair Flats Ship Canal).
Tashmoo. (Landing at Star Island—Two Views).
Toronto. (Thousand Islands).
Toronto. (Thousand Islands—at Alexandria Bay).
Toronto. (Thousand Islands—at Gananoque).
Transport, in Detroit River, Winter. (Car Ferry—
Two Views).
Troy.
Uganda, in Ship Canal at Duluth.
United Empire.
Capt. Visger. (Thousand Islands).
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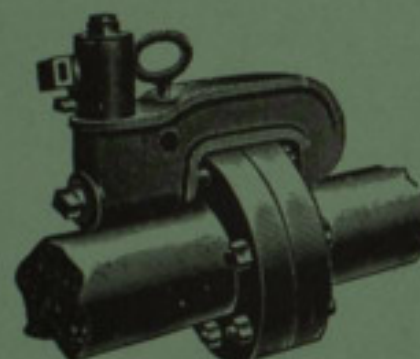
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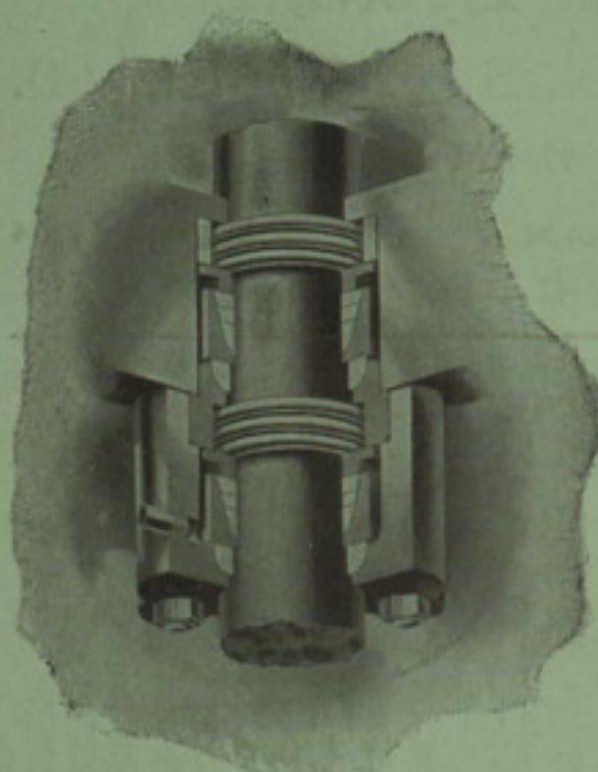
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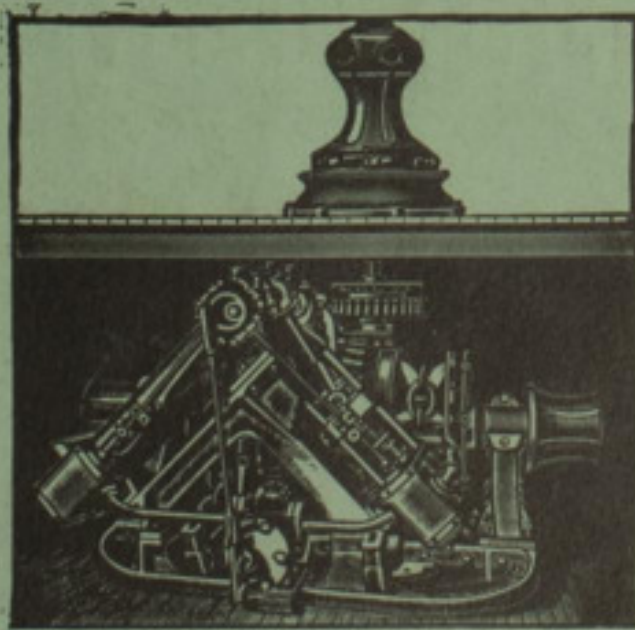
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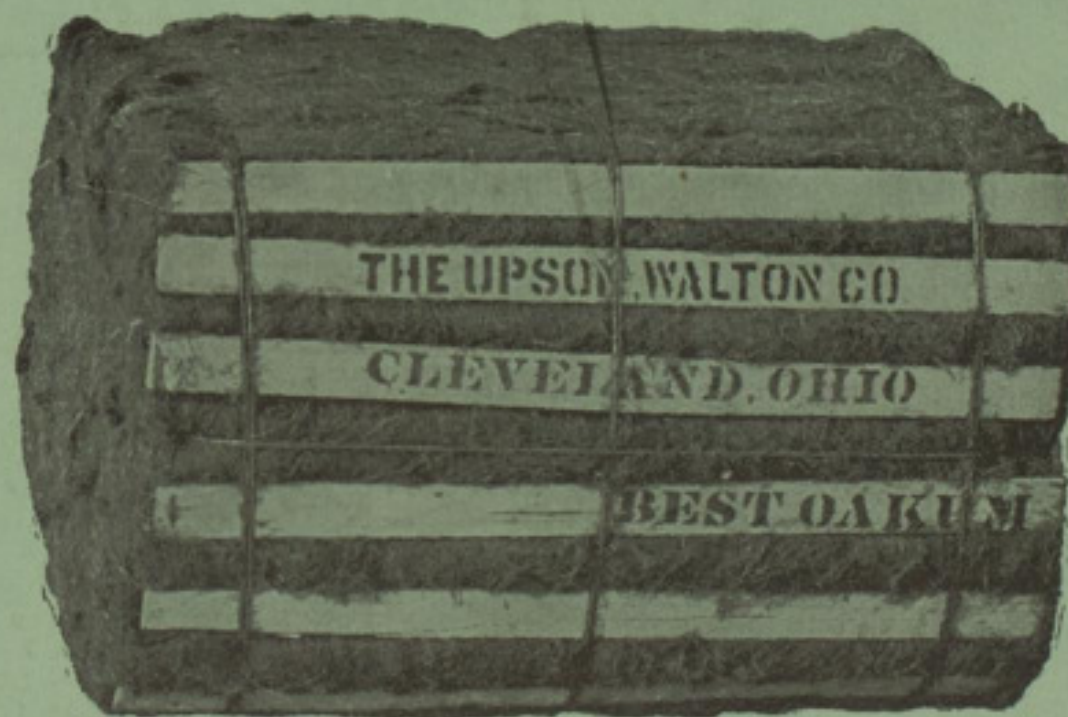
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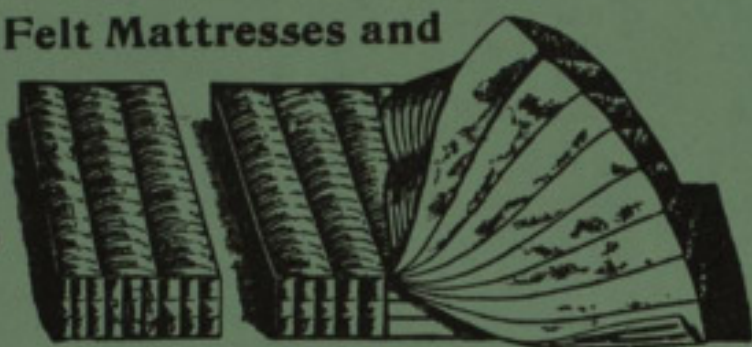
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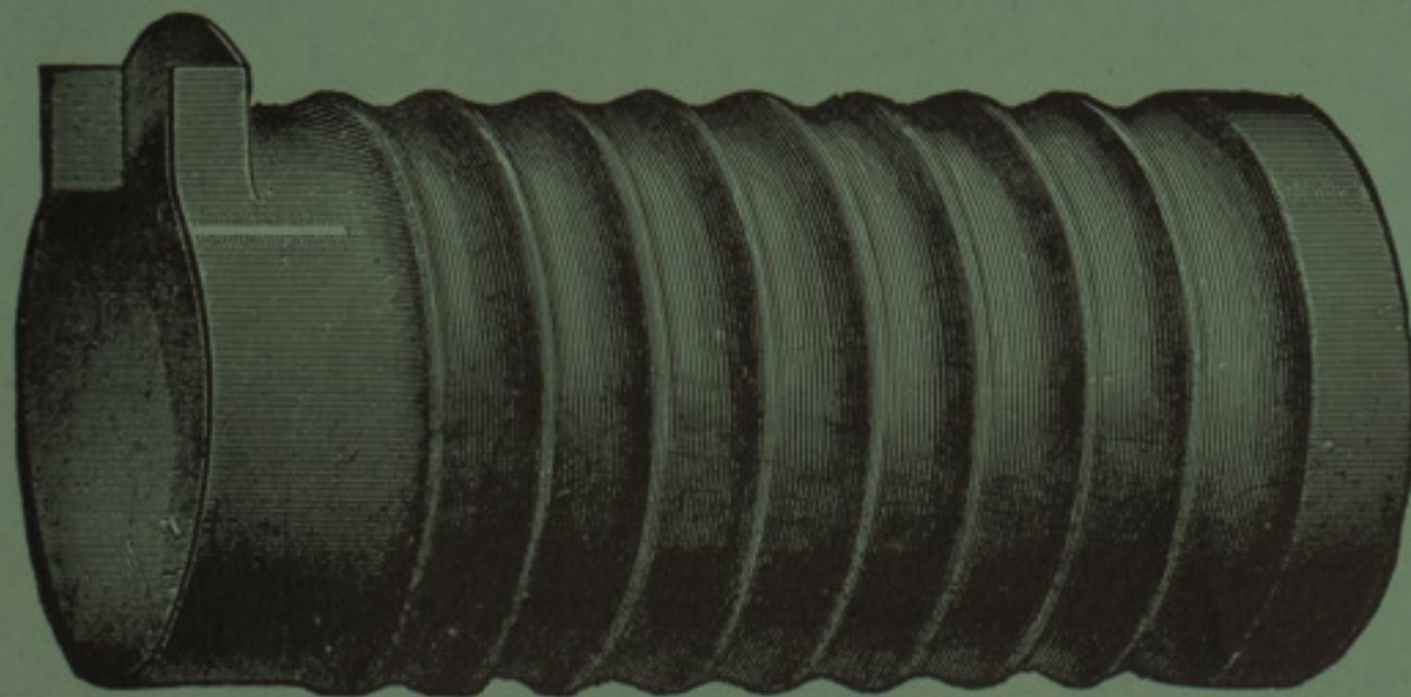
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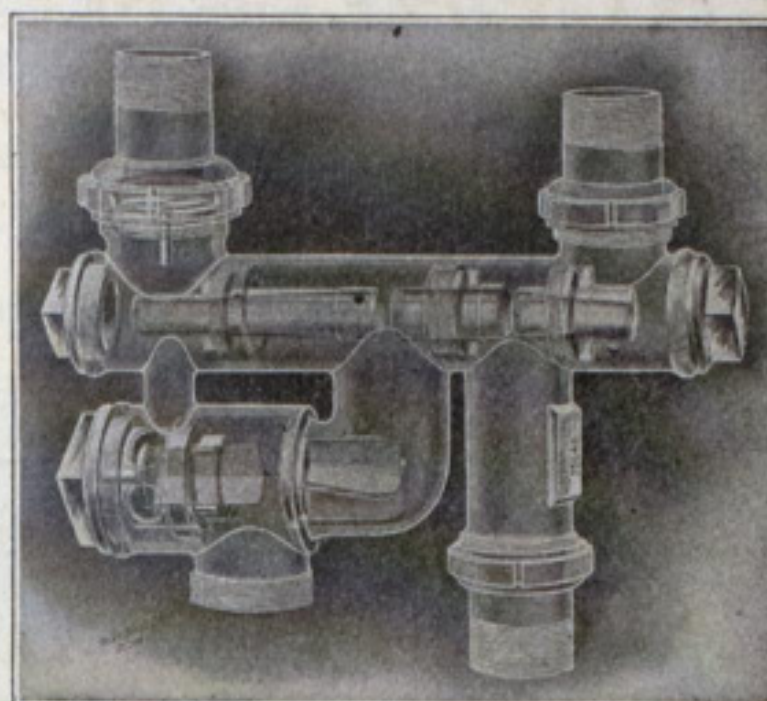
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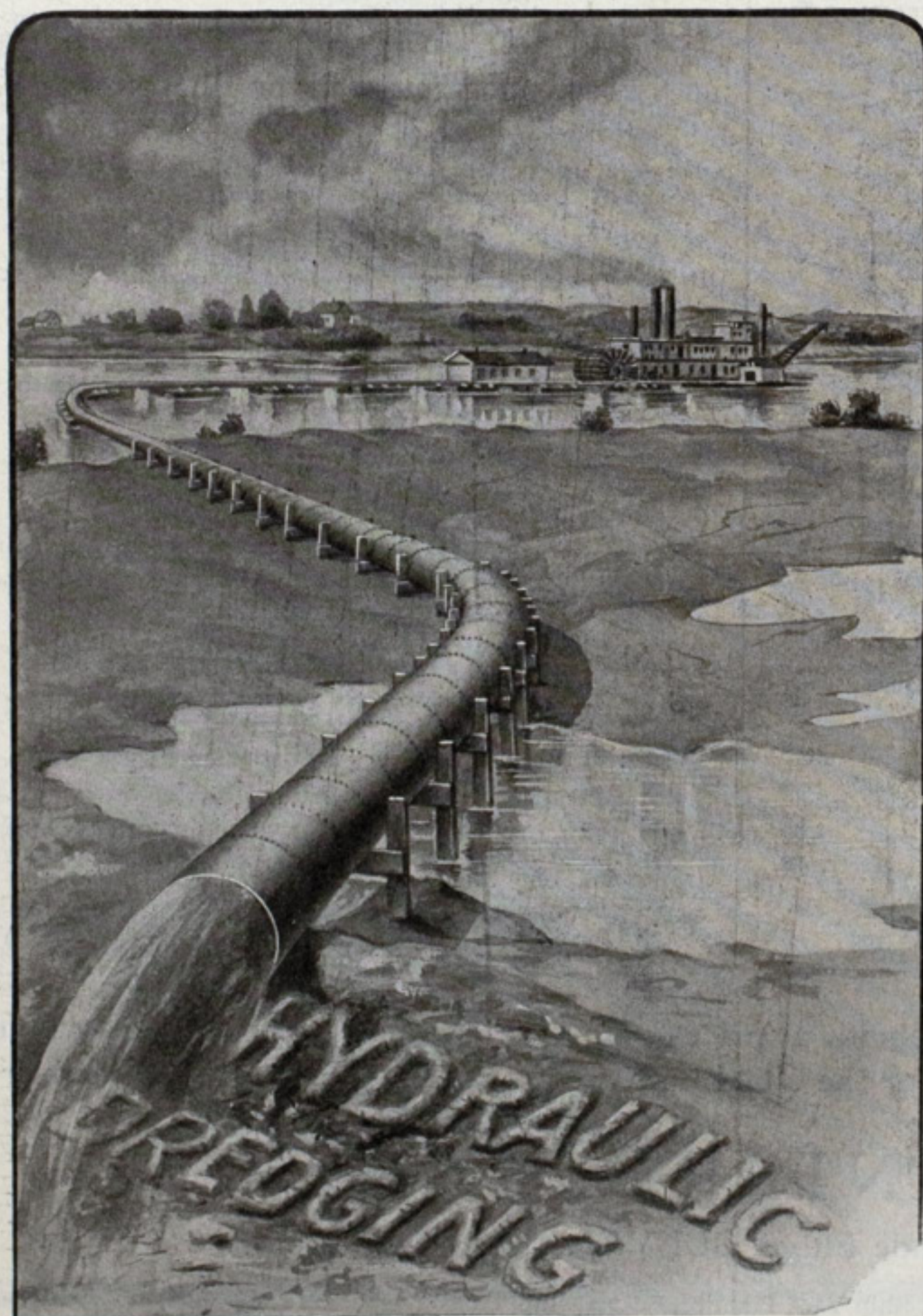
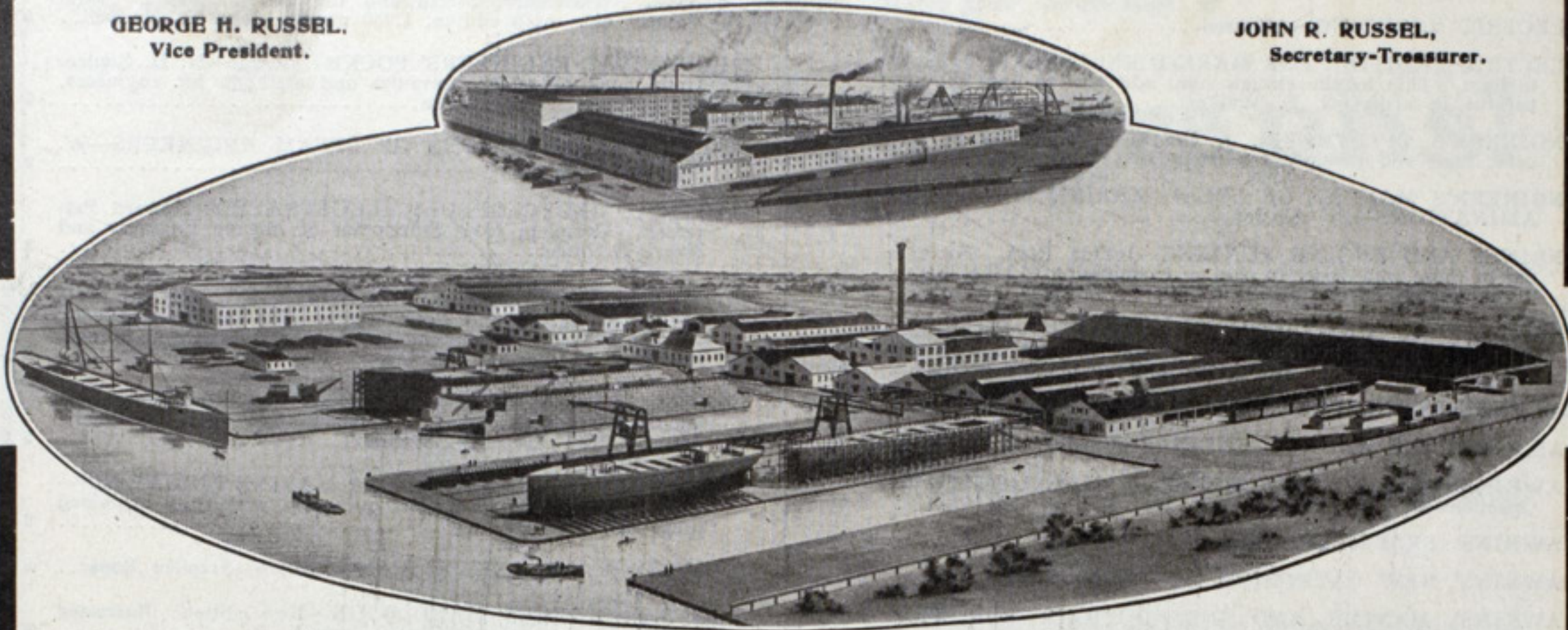
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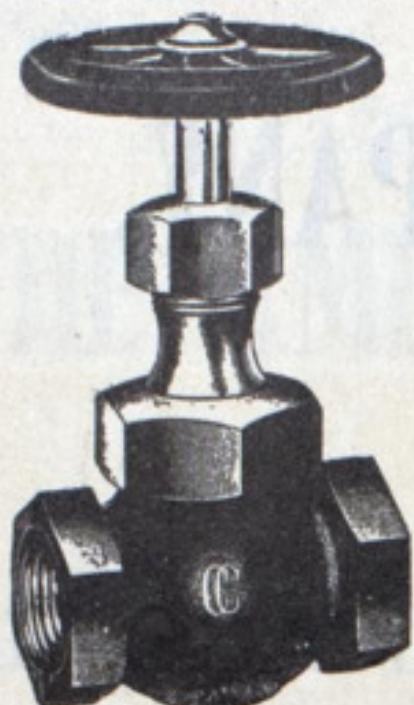
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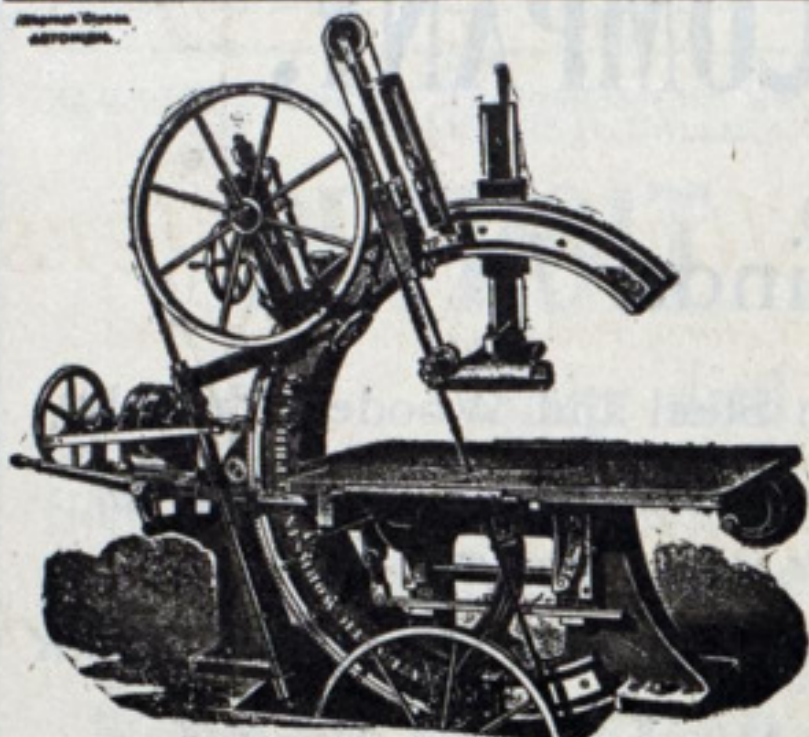
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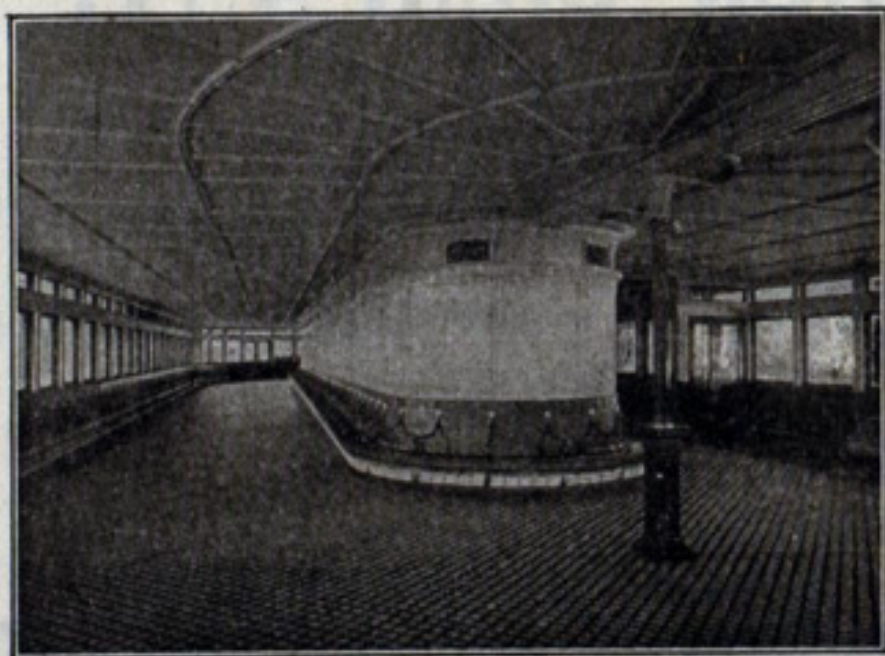
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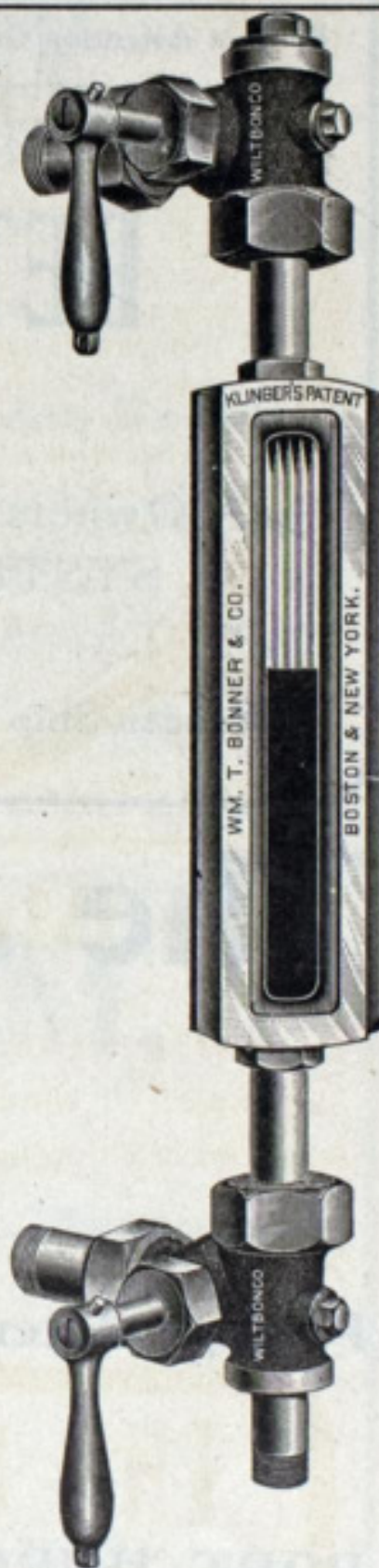
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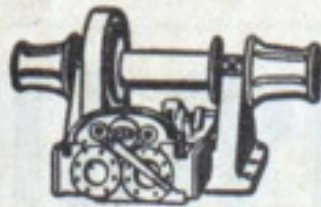
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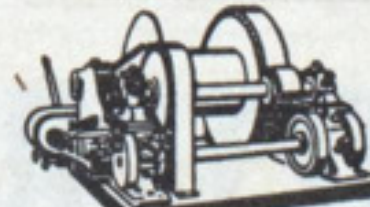
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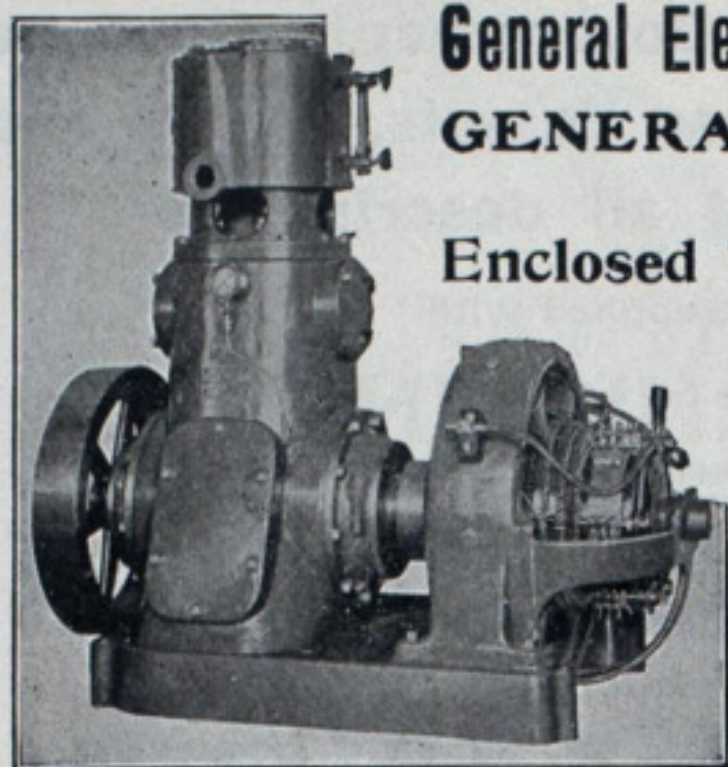
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